

I N D E X

Volume - II

(From pages 202 – 318)

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|----|--|-----------------|
| 3. | <u>ANNEXURE - RA/1 (Part-II)</u> | 202 - 318 |
| | True photocopy along with typed copy
of the relevant portion of the Oxford
Pro Bono Publico submission dated
Feb. 2013. | |

Continued Volume - III

(From pages 319 – 498)

Annexure VI.b.4

Backup Server

Sr. No	Parameter	Minimum Requirements	Unit of Measurement
1	Power Specification	Indian power specifications in terms of Phase, Voltage, Freq	Ø.V.Hz
2	Processor		
	Processor Type (CISC, EPIC, RISC)	Same as Rack Server	CISC / EPIC / RISC
3	Main Memory		
	Main Memory Type	ECC	(ECC / Non ECC)
4	Disk Controller		
	No. of channels in the proposed RAID controller	Single	Single / Dual / Quad
	Proposed size of battery backed cache	128 MB	MB
5	Internal Disks		
	Disk Speed	15000 RPM	RPM
	No of disks proposed		Units
	Are Proposed Disks Hot Swappable?	YES	YES / NO
6	DVD Drive		
	Optical Drive Proposed	DVD	DVD Drive
	No. of drives proposed	1	
	Is drive writeable / re-writeable?	YES	YES / NO
	DVD-R	YES	YES / NO
	DVD-RW	YES	YES / NO
	DVD+R	YES	YES / NO
	DVD+RW	YES	YES / NO
	DVD-RAM	YES	YES / NO
7	DAT Drive		
	Format Compatibility		
	DDS-1	YES	YES / NO
	DDS-2	YES	YES / NO
	DDS-3	YES	YES / NO
	DDS-4	YES	YES / NO
8	DLT Drive		
	No. of drives proposed	1	
	Format Compatibility		
	SDLT	YES	YES / NO
	DLT IV	YES	YES / NO
9	Network		
	Type of Ethernet controller proposed	Full duplex 10/100/1000 Mbps	YES / NO
	No. of Ethernet Controllers proposed		Units
			2
	No. of ports on each Ethernet controller proposed	Single	Single / Dual / Quad
	Dual Homing proposed	YES	YES / NO
	Teaming of Ethernet Controllers proposed	YES	YES / NO
10	Host based Adapters		
	Type of HBA proposed	Full duplex Fiber channel	
	Throughput of each of the proposed HBA	4/8 Gbps	Gbps
	No. of ports on each HBA proposed	Single	Single / Dual / Quad

B.D. Manawati, oos



Backup Server

Annexure VI.b.4

Sr. No	Parameter	Minimum Requirements	Unit of Measurement
	Total Throughput of all the proposed HBA together	8 Gbps	Gbps
	Capability to dynamically load balance between multiple HBA	YES	YES / NO
	Support for storage subsystems of leading manufacturers like EMC, Hitachi, HP, IBM, SUN etc.	YES	YES / NO
11	Any other software proposed (provide details)		
	Backup software	YES	YES / NO
12	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO

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S. P. Manawati, DDC

1. I am hereby certifying that the above details of bid are true and correct and I am not aware of any other bid submitted by any other bidder for the same lot.



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Annexure VI.b.5

Tape Library

Sr. No.	Parameter	Minimum Requirements	Unit of Measurement	Please mention deviations, if any
1	Power Specification	Indian power specifications in terms of Phase, Voltage, Freq	Ø,V,Hz	
2	Tape Drives			
	Type of tape drive proposed	LTO Gen 4		
	Type of tape drive interface	Native fiber channel		
	Sustained Data Transfer Rate (without compression)	120	MB/s	
	Sustained Data Transfer Rate (with compression)	240	MB/s	
	Size of Tape Storage (without compression)	800	GB	
	Size of Tape Storage (without compression)	1500	GB	
	Hot Swappable Tape drive proposed	YES	YES / NO	
	Hot Swappable Controller cards proposed	YES	YES / NO	
3	Tape Library Frame			
	No. of drives proposed	5		
	No. of frames proposed	1		
	No. of Fibre Channel ports proposed with this library	2		
	No. of Media slots proposed in the library	50		
4	Protocol Supported			
		FC	YES / NO	
		FCP	YES / NO	
		FC-AL	YES / NO	
5	Power Supply			
	Hot Swappable Power supply proposed	YES	YES / NO	
	(N+1) redundant power supply proposed	YES	YES / NO	
	Dual AC input proposed	YES	YES / NO	
6	Cooling Fans			
	Hot Swappable Cooling Fans proposed	YES	YES / NO	
	(N+1) redundant Cooling Fans proposed	YES	YES / NO	
7	Support for online automatic calibration of robotic arm	YES	YES / NO	
8	Support for NDMP for taking backup of NAS over LAN	YES	YES / NO	
9	Support for multiple hosts running OS including AIX, HP-UX, Linux, Solaris, Windows	YES	YES / NO	
10	Support			

D.P. Manawati, DDO



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Bid No. D-11018/14/Tech/10-UIDAI

Section VI - Minimum Requirements and Technical Annexure

Annexure VI.b.5

Tape Library

Sr. No	Parameter	Minimum Requirements	Unit of Measurement	Please mention deviations, if any
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO	
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO	
11	Media & Accessories		Hours	
	No. of tape media proposed	2500	Units	
	Size of tape media (uncompressed)	800GB	Units	
	Size of tape media (compressed)	1600GB	Units	
	No. of tape labels proposed	2500	Units	
12	Provisioning of Bar-Code Reader within the Tape Library & integration with proposed Media Management Software	YES		

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 M. Nandwadi, beg
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Annexure VI.b.6

Load Balancer

Sr. No.	Parameter	Minimum Requirement	Unit
1	Power Specification	Indian power specifications in terms of Phase, Voltage, Freq	Ø,V,Hz
2	Operating Relative Humidity range (non-condensing)		%
	Should be a multi processor based appliance	Yes	
	Traffic Throughput	8 Gbps	
	Network Connectivity support	4 x 10/100/1000, 1Gbps connectivity	
	Memory on the device	8GB	
	L4 concurrent connections	1 Million	
	L4 connections per second	100000	
	L7 concurrent connections	250000	
	Should support L7 connections per second	35000	
	Should support minimum L7 throughput	4 Gbps	
	Should support SSL offloading & HTTP acceleration from day one in same unit without adding another hardware to save rack space, power & cooling requirements	Yes	
	SSL Throughput	2 Gbps	
	Initial TPS support	35000	
	Max TPS support	50000	
	Hardware Compression Support	6-8Gbps	
	NAT entries	60000	
	Concurrent SSL connections	1,00,000+	
	Virtual Local area Network (Vlans)	512	
	Virtual servers	3000	
	Server farms	2500	
	Real servers	8000	
	Support for sticky table entries	100000	
	Should support Port Aggregation IEEE 802.3ad	Yes	
	Should support Vlan Trunk IEEE 802.1Q	Yes	
	Should have minimum 1Gb Flash Drive	Yes	
	Should support Port Mirroring	Yes	
	Should support following deployments	Yes	
	Routing Mode : where client-side and server-side VLANs are on different subnets	Yes	
	Bridge Mode : where client-side and server-side VLANs are on the same subnets.	Yes	

B.P. Naraswathi, DDC
 Director, Planning & Accounts
 Government of Karnataka
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Annexure VI.b.6

Load Balancer

Sr. No	Parameter	Minimum Requirement	Unit of Measurement
	Direct Server Response where SLB load balance an initial request from the client to a real server; however, the server directly responds to the client bypassing the SLB.	Yes	
3	Load Balancing Features		
	Server load balancing based on SNMP parameter like CPU load, Memory utilization etc	Yes	
	Should support Client NAT & Server NAT and PAT and NAT pool for Dynamic NAT	Yes	
	In case of Server / Application failure device should detect it in not more than 30 seconds	Yes	
	In case of Server failure traffic should be diverted to another Server automatically	Yes	
	Should support following content based Load balancing features	Yes	
	Support for protocols namely HTTP, FTP, DNS, Internet Control Message Protocol (ICMP), Session Initiation Protocol (SIP), Real-Time Streaming Protocol (RTSP), Extended RTSP, RADIUS, and Microsoft Remote Desktop Protocol (RDP).	Yes	
	HTTP Header based redirection	Yes	
	Should Support HTTP Header manipulation on Client requests and server responses	Yes	
	URL-Based Redirection	Yes	
	Browser Type Based Redirection	Yes	
	Preferential Treatment (Cookie-Based)	Yes	
	Should support End-to-End SSL Encryption (Backend Encryption)	Yes	
	Should support SSL initiation (SSL between SLB & Servers)	Yes	
	Predictors		

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Annexure VI.b.6

Load Balancer

Sr. No	Parameter	Minimum Requirement	Unit of Measurement
	Load Balancing algorithm should support following algorithm namely Least loaded, Round-robin, Adaptive response, Least bandwidth, Least connections, Hash address, Hash cookie, Hash header, Hash URL	Yes	
	Probe Support should be available for the protocols HTTP, HTTPS, SMTP, POP3, IMAP, RADIUS, SIP, RTSP, SNMP, Telnet, FTP, KAL-AP, ICMP, TCP, UDP, Echo, Finger, DNS	Yes	
	Support for scripted probes	Yes	
4	Server Management Features		
	Should support Graceful shutdown of Servers	Yes	
	Should support Graceful Activation of Servers	Yes	
	Should able to redirect traffic based on Source IP, Destination IP & TCP PORT	Yes	
5	Virtualization		
	The Load Balancer should support virtualization or segmentation where it should be possible to create virtual partitions from day one. Each of this Partition should be completely isolated from each other wrt dedicated access control and resource allocation	Yes	
	Should support Min & Max resource allocation per virtual Partition	Yes	
	Should support resource sharing between virtual Partitions so in case if resource is available with another virtual partition it can be borrowed automatically		
	Should keep configuration files separately for each virtual partition or segment	Yes	
6	Health Monitoring		
	Should provide individual health checks for real servers & farms	Yes	
	Should allow to monitor protocol like HTTP, SMTP, POP, FTP etc	Yes	

D.R. Nandwadi, DGC

For the purpose of this bid, the bidder shall be responsible for the technical specifications and shall ensure that the specifications are met.



Annexure VI.b.6

Load Balancer

Sr. No.	Parameter	Minimum Requirement	Unit of Measurement
	Should allow to configure Customize health probes based on TCP & UDP parameters	Yes	
	Should provide GUI to configure Health Monitoring	Yes	
	Should provide flexible Script based support for complex environments & advance health monitoring	Yes	
7	Redundancy		
	System and Session redundancy-failover should happen automatically, with no human intervention, Should Provide stateful failover capabilities	Yes	
	Should support Redundancy protocol like VRRP	Yes	
	Should support transparent failover between 2 devices	Yes	
	Should support transparent failover between 2 Virtual Instances configured on 2 different units	Yes	
	Should Supports active-standby and active-active redundancy topologies with automatic configuration synchronization	Yes	
	The failover should be transparent to other networking devices	Yes	
8	Security		
	Support for Access list	1000+	
	Should support HTTP deep packet inspection (HTTP header, URL, and payload)	Yes	
	Should support bidirectional Network Address Translation (NAT) and Port Address Translation (PAT)	Yes	
	Should support TCP Normalization & TCP connection state tracking	Yes	
	Should support ICMP flood guard	Yes	
	Should support Virtual connection state for UDP	Yes	
	Should support Sequence number randomization	Yes	
	Should support TCP header validation	Yes	
	Should support TCP window size checking	Yes	
	Should able to detect & drop same Source port & destination port traffic	Yes	

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Ministry of Health & Family Welfare, Government of India
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Annexure VI.b.6

Load Balancer

Sr. No	Parameter	Minimum Requirement	Unit of Measurement
	Should able to detect & drop L4 port 0 traffic	Yes	
9	Application Acceleration		
	Should Support SSL Offloading & Acceleration on same hardware to reduce number of equipment in Data center & save power / cooling requirement	Yes	
	SSL certificates support	6500	
	support for TPS	7500	
	Should support HTTP Compression technologies like GZIP & DEFLATE using dedicated hardware chips	Yes	
	Should use dedicated Hardware Card / Module for compression & not software based compression	Yes	
	Should support dynamic caching technologies	Yes	
	Should store cached content in RAM for faster content delivery	Yes	
	Should support transparent TCP Multiplexing (TCP Offloading)	Yes	
10	Management		
	Role Based administration support namely Admin, Security-admin, Network-Engineer, Network Monitor, Network Manager	Yes	
	Telnet	Yes	
	SSH	Yes	
	HTTPS	Yes	
	RS232 - Console Port	Yes	
	SNMP	Yes	
	Should support GUI for configuration & monitoring	Yes	
11	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	



P. S. Hanawati, DGS

Director, Information Security, Ministry of Home Affairs, Government of India, New Delhi-110055

Appendix VI.b.7

Terminal Server

Sr. No	Parameter	Minimum Requirement	Unit of Measurement
1	Power Specification	Indian power specifications in terms of Phase, Voltage, Freq	Ø,V,Hz
2	Network		
	No of asynchronous ports	24	number
	WAN Interfaces	Serial/BR/PRV Dialup xDSL	YES / NO
	Auxiliary and Console ports	YES	YES / NO
3	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO
4	Remote Management	Hardware based, Operating System Independent Remote Management having Integrated Management Log, Support for multiple user accounts with customizable access privileges with SSL level security, SNMP.	YES / NO

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Commissioner, Jharkhand
Government of India, Patna



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Appendix VI.b.8
Technical Specifications for Firewall -Dedup-DB Firewall

S.No	Parameters	Minimum Requirement	Unit of Measurement
1	Power Specification	Indian power specifications in terms of Phase, Voltage and Frequency	Ø,V,Hz
2	Architecture		
	The appliance a multiprocessing system Architecture for high performance	Yes	YES/NO
	System should support Firewall, IPSec, VPN, SSL VPN, Unlimited users/nodes	Yes	YES/NO
3	High Availability Features		
	Capability to detect hardware failure during powerup and before going online	Yes	YES/NO
	Stateful failover to prevent session losses to minimal Firewall support rack serviceability with easy access mainboard	Yes	YES/NO
	Software reconfiguration/ configuration changes are immediate effect	Yes	YES/NO
	Support active/active and active/standby failover	Yes	YES/NO
	Should support VPN Clustering and Loadbalancing	Yes	YES/NO
	Support in-built environmental monitoring capabilities.	Yes	YES/NO
4	Concurrent Sessions	at least 1500000 and at least 80000 sessions per second	
5	System Throughput	at least 5Gbps and higher	gbps
6	Memory	at least DRAM - 5GB or higher at least Flash Memory 1GB- or higher or any other storage if required	GB
7	Ports	minimum 4 Nos 1 Gbps ports and expandable minimum 6 Nos of 10Gbps Ports and expandable	units
8	Expansion option	Network interfaces like Fast Ethernet/Gig Ethernet/10G Ethernet modules	units
9	Application and protocol inspection	Should integrate with more than 24 specified inspection engines for protocols such as: (but not limited)	
		Advanced Web Browsing (HTTP)	YES/NO
		File Transfers (FTP)	YES/NO
		Electronic mail (SMTP)/SMTP	YES/NO
		Domain Name System (DNS)	YES/NO

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Simple Network Management Protocol (SNMP)	YES/NO
Database (SQL*Net)	YES/NO
Network File System (NFS)	YES/NO
IP Telephony - H.323,SIP	YES/NO
VoIP	YES/NO
Session Initiation Protocol (SIP)	YES/NO
Real-Time Streaming Protocol (RTSP)	YES/NO
Internet Locator Service (ILS)	YES/NO
Provider voice services (MGCP,GTP/GPRS)	YES/NO
Network Information services (NIS+)	YES/NO
Stateful ICMP inspection	YES/NO
IPv6 transparent	YES/NO
Timebound, Out bound ACLs	YES/NO
Inspection engine should support an interface,network or host	YES/NO
Tunneled applications (peer-to-peer file sharing or instant messaging)	YES/NO
Supports:	
IKE	YES/NO
IPSec VPN standards	YES/NO
PPTP	YES/NO
56-bit DES	YES/NO
168-bit 3DES	YES/NO
OSPF routing and QOS over VPN	YES/NO
Diffie Hellman Group 7	YES/NO
x 509	YES/NO
Up to 256-bit AES data encryption	YES/NO
Integrates with popular AAA services via	YES/NO
RADIUS	YES/NO
TACACS+	YES/NO
Accounting for management traffic	YES/NO
Native Active Directory user authentication(VPN only)	YES/NO
Native SecureID authentication (VPN only)	YES/NO
Support for:	
Port redirection and TCP intercept	YES/NO
Rack Mountable	YES/NO
ActiveX blocking	YES/NO
URL filtering and Java Security	YES/NO

1. D. Manowati, 500



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Appendix VI.b.8
Technical Specifications for Firewall -Dedup-DB Firewall

		Support against all network and application level attacks ranging from malformed packet attacks to DoS attacks	YES/NO
		Support for ability to customize protocol port numbers	YES/NO
		Support upto 1536 bit RSA and Diffie-Hellman, MD-5,SHA-1	YES/NO
13	DHCP relay	Forwards DHCP requests from internal devices to an administrator-specified DHCP server, enabling centralized distribution, tracking, and maintenance of IP addresses	YES/NO
		Provides:	YES/NO
		Rich dynamic NAT and PAT services	YES/NO
		Static NAT and PAT services	YES/NO
		Policy-based NAT and PAT services	YES/NO
14	X.509 certificate and CRL support	Supports Simple Certificate Enrollment Protocol (SCEP)-based enrollment with leading X.509 solutions from Baltimore, Entrust, Microsoft, and VeriSign	YES/NO
15	Management		
		Web based management to support for remote monitoring	YES/NO
		Accessible through variety of methods including : Telnet, Console Port,SSH	YES/NO
		Dedicated Out-of-Management interface	YES/NO
		Support SNMPv1, v2, v3	YES/NO
		Support for security event logging	YES/NO
		Support real time alerting and notification features and syslog	YES/NO
		Should have the ability to create customizable administrative roles/profiles (monitoring only, read-only access to configuration, VPN	YES/NO

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S.P. Hanawati, DDO
District Administration
District of Jammu



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Appendix VI.b.8
Technical Specifications for Firewall -Dedup-DB Firewall

16	End point verification		
		Support for end point authorization based on multiple variables of each VPN connection associated with specific tunnel or session	YES/NO
17	Software features		
18		support for RIPv2, OSPF, VLAN, LAN Based failover, DHCP Support, static&Dynamic NAT/PAT Support H.323,SIP,FTP,etc Bidirectional NAT, NAT transparency, Split tunneling VPN,	YES/NO
19	Software	Latest release with all supported features as required	
20	Broadcast Application		
		Support for Microsoft Networking client server communication	YES/NO
		support for multimedia Real Audio Video Stream Works, Applications based on H.323 standards	YES/NO
		Support for Oracle SQL and ERP applications	YES/NO
21	Client VPN		
		support and not limited to Internal websites/web enabled applications,	YES/NO
		Email- POP3S,IMAP4S,SMTPS.	YES/NO
		Support also telnet,RDP,VNC, MAPI and Application Access support	YES/NO
22	Mounting	Standard 19-in rack with required hardware	YES/NO
23	Compatibility with proposed network devices	Yes	YES/NO
24	Compatibility with proposed network security devices	Yes	YES/NO



Appendix VI.b.8
Technical Specifications for Firewall -Dedup-DB Firewall

25	Compatability with proposed servers	Yes	YES/NO
26	Power Supply		
	Hot Swappable Power supply proposed	Yes	YES / NO
	(N+1) redundant power supply proposed	Yes	YES / NO
	Dual AC input proposed	Yes	YES / NO
27	Cooling Fans		
	Hot Swappable Cooling Fans proposed	Yes	YES / NO
	(N+1) redundant Cooling Fans proposed	Yes	YES / NO
28	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	


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P. C. Manawati, DDO
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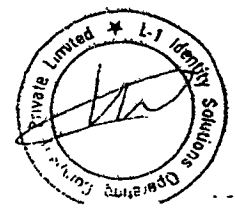


Appendix VI.b.9

Web Server

Sr. No	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	Protocols Supported	http(s)	YES / NO
2	Security & Authentication		
	Client Authentication	Userid/Passoword, PKI (digital certificates)	
3	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO



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 Director, Central Data Processing & Information System
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Appendix VI.b.10

Fire Resistant Cabinets

Sr. No.	Parameter	Minimum Requirements	Unit of Measurement
7	Interior Temperature range	50 °C	°C
8	Interior Relative Humidity range (non-condensing)	80%	%
12	Maximum Temperature sustainable at the required interior Temperature and humidity	1000 °C	°C
13	Maximum exposure time to fire	1 hour	hours
14	Comply to Class UL-125 - 1 hour specifications	YES	YES / NO
15	Manufacturer of cabinets is ISO 9001:2000 certified	YES	YES / NO
16	Warranty for period of contract	YES	YES / NO



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Appendix VI.c.1

Virtualization Server Software

Sr. No.	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO


D.P. Nandawati, DDO
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Appendix VI.c.2

Virtualization Server Manager Software

Sr. No	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	General management		
	Performance monitoring capabilities includes resource utilization (CPU utilization, memory, disk I/O, and network I/O) for a host server and virtual machine	YES	YES/NO
	Maintain version and inventory of virtual machines	YES	YES/NO
	Automated deployment of VMs, OS patches and applications	YES	YES/NO
2	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc. for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO

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R. J. Hanawalt, DDO
Public Accounts Officer
Ministry of Information and Public Relations
Government of India



Appendix VI.c.3

Backup Software

Sr. No.	Parameter/ Features	Minimum Requirements	Unit of Measurement	Please mention deviations, if any
1	Should have capability to support for all major Operating system clients including, but not limited to AIX, HP-UX, Solaris, Microsoft Windows, Linux, etc	YES	YES / NO	
2	Support for heterogeneous storage solutions including EMC, Hitachi, HP, IBM, Network Appliance, Sun, etc.	YES	YES / NO	
3	Should be flexible and configurable to adapt to organization's backup policy	YES	YES / NO	
4	Should have capability to generate scripts	YES	YES / NO	
5	Should have support for Development kits / API for customization of scripts		YES / NO	
6	Capability to configure automated backups with customized frequency based scheduling based on the backup policy.	YES	YES / NO	
7	Full fledged Media Library Management, including complete and automated offsite tape management, creation of pickup and drop lists, tracking of tapes, etc.	YES	YES / NO	
8	Should be configurable for incremental backups or full-backup of the applications, database, files, etc	YES	YES / NO	
9	Capability to leverage Storage Area Networks (SAN), Network Attached Storage (NAS) and Gigabit Ethernet for backup and recovery	YES	YES / NO	
10	Should leverage provisioning of Business Copy by various storage vendors for zero-downtime backup.	YES	YES / NO	
11	Rich GUI with single screen monitoring for complete backup / restore activities	YES	YES / NO	
12	Capability to retrieve selectively based on search criteria		YES / NO	
13	Capability to backup the entire configuration of the server and restore it from scratch the entire system including configuration when in a scenario of hardware failure	YES	YES / NO	

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D.P. Narasimhan, DDO
District Collector, Bangalore
District Collector, Bangalore
District Collector, Bangalore



Appendix VI.c.3

Backup Software

Sr. No	Parameter/ Features	Minimum Requirements	Unit of Measurement	Please mention deviations, if any
14	Time required for the restoration of the configuration on to the server		Minutes	
15	Capability to read and write multiple streams simultaneously to / from one or more tapes and from more than one clients/servers	YES	YES / NO	
16	Should allow for a failed backup or recovery job to be resumed from the point of failure rather than restarting the job all over again.	YES	YES / NO	
17	Should allow for a failed backup or recovery job to be resumed from the point of failure rather than restarting the job all over again.	YES	YES / NO	
18	Should be configurable for usage of network bandwidth it should provide the administrator the capability to throttle and restrict bandwidth usage on LAN.	YES	YES / NO	
19	Capability to integrate with the ERM proposed	YES	YES / NO	
20	Support			
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO	
	Provide new version upgrades, updates, patches, etc. for all the components / sub-components through the period of contract	YES	YES / NO	
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO	

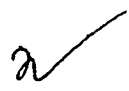
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D. P. Mahapatra, DDO
District Administration, District
Collector's Office, District
Collector's Office, District



Appendix VI.c.4

Replication Software

Sr. No	Parameter/ Features	Minimum Requirements	Unit of Measurement	Please mention variations, if any
1	Support			
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO	
	Provide new version upgrades, updates, patches, etc for all the components / sub-components through the period of contract	YES	YES / NO	
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO	


B.D. Menonati, DDO
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Appendix VI.c.5

Anti-Virus Software

Sr. No.	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	Product Name	McAfee / Symantec / Trend Micro/Other	
2	Version	Enterprise Edition	
Licenses for components that are prices and sold separately should be indicated as			
	Other 2		
3	Protection for Desktop / Servers	YES	YES / NO
4	Security for SMTP	YES	YES / NO
5	Security for Microsoft Exchange/Lotus Domino	YES	YES / NO
6	Security for Lotus Domino	YES	YES / NO
7	Gateway Antivirus	YES	YES / NO
8	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO


✓
D. Nandwadi, bps
[Signature]
[Stamp]

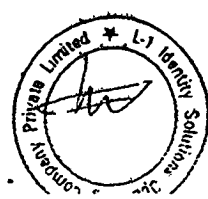


Appendix VI.c.6

Syslog Software

Sr. No.	Parameter/ Features	Minimum Requirements	Unit of Measurement
Licenses for components that are prices and sold separately should be indicated as			
1	No. of Licenses (Primary Site)		
	Client	For all servers and devices	
2	Capable of receiving messages via UDP, TCP or SNMP	YES	YES / NO
3	Capable of forwarding messages via UDP or TCP	YES	YES / NO
4	Capable of sending SNMP traps	YES	YES / NO
5	Buffer for 20000 Syslog messages to ensure no loss of messages under heavy load.	YES	YES / NO
6	Support RFC3164 send and receive options	YES	YES / NO
7	Pass values from the received Syslog message to an external program, e-mail message or Syslog message	YES	YES / NO
8	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc. for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO



 D.P. Menawati, doc
 Project Manager, IT
 Ministry of Home Affairs
 Government of India



Appendix VI.c.7

Cluster File System

Sr. No	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	Should be certified by db vendors for operation in active-active, active-standby mode	YES	YES / NO - list support/constraints if any with the databases Oracle, MySQL, MS SQL, DB2
2	Should also have capability to run the database on raw file system if required.	YES	YES / NO
3	Journalled File System	YES	YES / NO
4	Capability for online resizing, online backups and online defragmentation	YES	YES / NO
5	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc. for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO


 M. Mahapatra, bpg
 General Manager, IT & Technology
 Government of India, New Delhi



Appendix VI.c.8

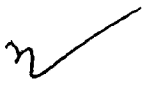
SAN Fabric Manager

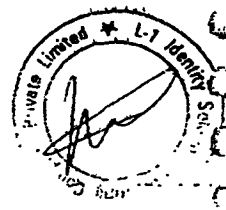
Sr. No	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	Should provide a GUI based software	YES	YES / NO
2	Should be integrated with the proposed ERM solution to offer a single window for monitoring.	YES	YES / NO
3	Capabilities and visibility to capture status of entire Storage Area Network objects Example.Fabric Switches, Storage etc .	YES	YES / NO
4	Should have capability for automated monitoring and notification of changes in the fabric	YES	YES / NO
5	Enable dynamic discovery and control of all SAN components.	YES	YES / NO
6	Capability for Fabric, switch and port naming and enable assignment of specific names to SAN objects.	YES	YES / NO
7	Capability for change management so as to tracks changes to fabric objects.	YES	YES / NO
8	Capability for traffic prioritization from Hosts at FC port level.	YES	YES / NO
9	Should allow administrators to capture configuration of switch, backup the same and compare it to current switch configurations	YES	YES / NO
10	Should undertake end-to-end Performance Monitoring and permit early fault detection and isolation along with performance measurement	YES	YES / NO
11	Security protection for management should make use of digital certificates and digital signatures, multiple levels of password protection, strong password encryption and PKI-based authentication	YES	YES / NO
12	Capability for Hardware enforced Zoning	YES	YES / NO
	Wizards for zone configuration, inter-VSAN routing (IVR), PortChannels, Fibre Channel over IP (FCIP) tunnels, and IP access control lists (ACLs)	YES	YES / NO
	Support Zoning / LUN masking, port binding, port masking, etc	Yes	
	Support for Detailed Fabric configuration example: Port Configuration, Supervisor Module Upgrade, Hardware replacement ,Compare switch configurations etc	Yes	
	Support for CLI interface from GUI	Yes	



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	Interoperability support with different Fabric Switch Manufacturer	No	
	Support for Managing more than one Fabric Management Instance	No	
	Support for Managing FCOE Switches	No	
	Support for Schedule periodic backups of running switch configuration	Yes	
13	Support for Managing Fabric switch alarms, Notifications and Events	Yes	
	Support for reporting of Storage Area Network on Inventory, Port Utilization, Zone Configuration, Trunk Configuration, Performance Reports namely, Port Utilization, Switch Bandwidth utilization, Report on health of the fabric switch, Report on License Utilization and inventory	Yes	
14	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc. for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO


M. D. H. Sawati, DDO
Department of Information Technology
Ministry of Health and Family Welfare
Government of India



Appendix VI.c.9

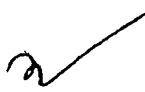
Storage Manager

Sr. No	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	Should provide a GUI based software	YES	YES / NO
2	Should be integrated with the proposed ERM solution to offer a single window for monitoring.	YES	YES / NO
3	Capabilities manage heterogeneous storage arrays from leading vendors		
	EMC	YES	YES / NO
	Hitachi	YES	YES / NO
	HP	YES	YES / NO
	IBM	YES	YES / NO
	Network Appliance	YES	YES / NO
	Sun	YES	YES / NO
4	Should integrate with proposed Backup software	YES	YES / NO
5	Policy Management		
	Configuration of parameters	YES	YES / NO
	Volume allocation	YES	YES / NO
	Storage reconfiguration	YES	YES / NO
	Cache management	YES	YES / NO
	Reallocation of capacity	YES	YES / NO
	Monitoring, analyzing, tuning performance	YES	YES / NO
	Automated customizable policy based provisioning / allocation of storage	YES	YES / NO
6	Addition of new hosts without any downtime	YES	YES / NO
7	Fast file system recovery	YES	YES / NO
8	Extent-based allocation of disk to files	YES	YES / NO
9	Online file de-fragmentation	YES	YES / NO
10	Directory optimization	YES	YES / NO
11	Dynamic load balancing with functionality for spreading I/O between the multiple paths of multi-controller disk arrays to increase the performance and availability	YES	YES / NO
12	Automatic path failover and dynamic recovery	YES	YES / NO
13	Monitor all the paths that are configured	YES	YES / NO
14	Support periodic auto detection of failed path without the need for manual detection	YES	YES / NO
15	Capability to define, configure, add, delete, expand, and reassign Logical Unit (LUN) to specific paths non-destructively and without having to reboot the system	YES	YES / NO
16	Provide various reports for management	YES	YES / NO

[Signature]
D.P. Nanawati, DOG
Director, Identification Authority of India
Ministry of Home Affairs, Government of India
Connaught Circus, New Delhi-1100



17	Measure the performance statistics of each and every component of the storage subsystem and should also provide an extensive set of graphs	YES	YES / NO
18	Real time and historical monitoring and support threshold based alert mechanism	YES	YES / NO
19	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc. for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO


B.P. Hanavati, DGS
Director, Information Technology & E-Governance,
Ministry of Agriculture & Farmers Welfare,
Government of India, New Delhi-110 001



Appendix VI.c.10

Network Management Console Software

Sl. No.	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	Product Name	Network Management Software	
2	software	latest release with all software features and licenses as required on both server and clients	
3	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc. for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO

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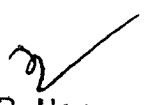
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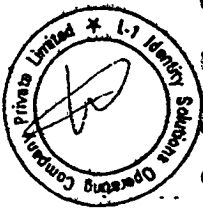


Appendix VI.c.11

Linux Operating System

Sr. No.	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	Product Name	Red Hat Linux	
2	Version	Redhat Ent Linux 5.0 (upgrade 1 or higher)	
3	No. of Licenses (Primary Site)		
	Max Physical CPU/sockets per server	2	
4	Memory		
	Max physical memory per server	64 GB	
	Max file system size (each)	10 TB	
5	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc. for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO

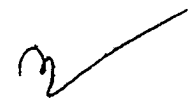

D. P. Harawati, DGG
Director General, Government of India
Ministry of Information and Public Relations
New Delhi



Appendix VI.c.12

Windows Operating System

Sr. No	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	Product Name	Windows	
2	Version	2003/2008	
3	No. of Licenses (Primary Site)		
	Max Physical CPU/sockets per server	2	
4	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc. for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO


 F.D. Mondal, DDC,
 Technical Officer,
 Central Procurement Directorate,
 Government of India



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Appendix VI.c.13

OS Clustering Software

Sr. No.	Parameter/ Features	Minimum Requirements	Unit of Measurement
1	Should be certified by Databases for operation in active-active, active-standby mode	YES	YES / NO (list supported databases)
2	Should provide support for running multiple instances of the same application on the cluster.	YES	YES / NO
3	Should support non-intrusive TCP connection failover.	YES	YES / NO
4	Should ensure cluster members stay in sync and communicate their status instantly through cluster interconnect.	YES	YES / NO
5	Should allow simultaneous access to share storage from multiple servers that are configured in load sharing mode.	YES	YES / NO
6	Should allow policy-based, cascading, and multi-directional fail-over	YES	YES / NO
7	Should be capable of intelligent workload management and should allow administrators to set fail-over policies based on server capacity thresholds and available resources	YES	YES / NO
8	Should provide easy management through user friendly GUI interface.	YES	YES / NO
9	Should be compatible and should integrate with the backup software provisioned.	YES	YES / NO
10	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES / NO
	Provide new version upgrades, updates, patches, etc. for all the components / sub-components through the period of contract	YES	YES / NO
	Will the proposed product/solution reach End-of-support during the currency of contract?	NO	YES / NO

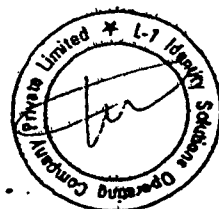
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S.D. Menawati, DDC
The Joint Unit for the Audit and
Commission for the
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Appendix VI.c.14

Technical Specifications for Event Correlation, management and monitoring

SI No	Parameters	Minimum Requirements	Unit of Measurement
1	Power Specification	Indian power specifications in terms of Phase, Voltage and Frequency	Ø,V,Hz
2	Product Name	Enterprise event correlation, security monitoring and management	unli
3	Version	Latest software with all features as required for the solution	
4	Network Interface	1G Ethernet or 10G Ethernet	gbps
5	Number of Network Interfaces	at least 2	
6	number of events	minimum 7000 event per sec	YES/NO
7	number of devices	miimum 900 devices	YES/NO
8	Event/Log collection storage	at least 1TB storage, RAID protected, High Performance disks	YES/NO
9	Support Log encryption	yes	YES/NO
10	Support high availability	yes	YES/NO
11	Log Replication capabilities	yes	YES/NO
12	Data management tools(copy, purge and move)	yes	YES/NO
13	Event/Log collection:		
	Collect events and logs at real time to a centralized log and Event Management system with secure storage	yes	YES/NO
	Regular signature and vulnerability information	yes	YES/NO
14	System Device support Capabilities		
14.1	Operating system		
	support not limiting to MS Windows, Linux, Solaris, HP UX, AIX	yes	YES/NO
14.2	Network Devices		
	Support device Support not limiting to Routers, Switches, Wireless Access points	yes	YES/NO
14.3	Database		
	Support not limiting to Oracle, MS SQL	yes	YES/NO
14.4	Security Device		
	Support not limiting to Firewalls, IPS,NIDS, NIPS,HIDS, Antivirus Solutions, IPSec gateways	yes	YES/NO
14.5	Virtual Environments		
	support not limiting to Vmware, Vcenter,Vmware	yes	YES/NO



14	Customization capabilities to support home grown applications	yes	YES/NO
15	Alert and Correlation		
	Web based ability to monitor and manage devices which are part of solution	yes	YES/NO
	Correlation support but not limited to - Rule Based, Behaviour Based, Vulnerability based, User defined, Baseline based	yes	YES/NO
	Provide real-time dashboard and global view of all data captured	yes	
	Ability to define the network baseline and alerts	yes	YES/NO
	Capability to alert via but not limiting to -email, syslog notifications, SNMP traps, syslog	yes	YES/NO
16	Reports		
	Standard reports should be available as part of solution and made available as and when vendor release the upgrade at no cost	yes	YES/NO
	Ability to schedule standard user defined reports	yes	YES/NO
17	Management		
	System should allow multi user access	yes	YES/NO
	AAA support for TACACS, RADIUS, Active Directory	yes	YES/NO
	Role Based Access to administrator web portal	yes	YES/NO
18	Process		
	Support ticketing/workflow management capabilities	yes	YES/NO
	Allow third party ticketing systems like but not limited to - BMC Remedy, CA Unicenter, Service Desk, etc	yes	YES/NO
	Automatic incident creation based on alerts	yes	YES/NO
19	Mounting	Standard 19-in rack with required hardware	
20	Compatibility with proposed network devices	Yes	YES/NO
21	Compatibility with proposed	Yes	YES/NO
22	Power Supply		
	(N+1) redundant power supply proposed	YES	YES / NO
23	Cooling Fans		
	(N+1) redundant Cooling Fans proposed	YES	YES / NO
24	Support		
	Is the proposed product/solution End-of-life or will reach End-of-life within 24 months from the date of submission of bid or 12 months from the date of acceptance, whichever is later?	NO	YES/NO

[Signature]
 D.P. Nanawati, DDC
 Director, Identification Authority
 Central Government, Jaipur
 Government of India, New Delhi



Annexure H – Breakup of Cost

✓
N. Mancinelli, DDO
Director of the Department of
the Ministry of the Interior
Rome, 10/10/2011



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Unit Price for Enrollment Allotted Transaction for de-duplication services (in INR)			
Item Description	Base Price	Total Taxes, Duties and Levies	Total Price
Price quoted per allotted transaction for de-duplication services	2.49	0.26	2.75

✓
S.D. Nayak, CEO
L-1 Identity Solutions Private Limited
100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000



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Annexure I

Non-Disclosure Agreement as submitted by M/s L-1 Identity Solutions
Operating Company Private Limited

✓

S. P. Manawati, DDO
Joint Director of Police
Joint Director of Police
Joint Director of Police


Page 1 of 1



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Annexure J

Technical Bid as submitted by M/s L-1 Identity Solutions Operating
Company Private Limited


M.D. Narasimhan, CEO
L-1 Identity Solutions Operating
Company Private Limited
10th Floor, 10th Cross, New E-3, 1st Stage,
10th Cross, New E-3, 1st Stage,


Page 1 of 1



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Annexure K

Commercial Bid as submitted by M/s L-1 Identity Solutions Operating
Company Private Limited


D. P. Menawati, ooo
Director, L-1 Identity Solutions Operating
Company Private Limited

Page 1 of 1



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Annexure L

Acceptance Letter of L1 Bidder commercial quote



July 16, 2010

Shri B. B. Nanawati
Deputy Director General
Unique Identification Authority of India (UIDAI)
Planning Commission, Govt. of India (GoI)
3rd Floor, Tower II, Jeevan Bharati Building
Connaught Circus
New Delhi - 110001

Re: L-1 Identity Solutions Operating Company;
UIDAI - RFP

Dear Shri.B.B. Nanawati,

Based on the UIDAI's request earlier today, the L-1 Consortium ("L-1") hereby retracts our letter to you dated July 15, 2010 and agrees to match Accenture's lowest bid price of 2.75 Rupees per allotted enrollment transaction.

We very much look forward to serving the UIDAI and participating in this important program.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Machiel van der Harst".

Machiel van der Harst
Technology Officer,
L-1 Identity Solutions Operating Company

177 Broad Street, 12th Floor Stamford, CT 06901 203-504-1100



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Annexure M

The Purchaser's order dated 30th July 2010



GOVT OF INDIA
PLANNING COMMISSION
UNIQUE IDENTIFICATION AUTHORITY OF INDIA
3rd Floor, Tower II, Jeevan Bharati Building,
Connaught Circus, New Delhi - 110001.

F.No. D-11018/14/Tech/10-UIDAI - 2155

Dated : 30.07.2010

To

M/s L1 Identity Solution Operating Company,
2, Frontline Grandeur,
14 Walton Road,
Bengaluru - 560 001

Sir,

Sub : Implementation of Biometric Solution for UIDAI - Order
- Regarding.

Please refer to the Technical and Commercial Bids submitted by you in response to Tender No D-11018/14/Tech/10-UIDAI on the above mentioned subject and your revised financial proposal dated 16 07 2010.

2. M/s Accenture Services Pvt Ltd, M/s Satyam Computer Services Ltd (Mahindra Satyam) and M/s L1 Identity Solution Operating Company have been selected as the three Biometric Solution Providers for undertaking the scope of work as stated in "Section V - Scope of Work" of the Bid Document. It may be noted that the contract period would be 2 (two) years or 20 crores enrolment transactions, whichever is earlier
3. Accordingly, we are pleased to place an order on M/s L1 Identity Solution Operating Company, for Implementation of Biometric Solution for UIDAI, for an estimated maximum 10.60 crore enrolment transactions, at a cost of Rs. 2.75 (Rupees Two and Paise Seventy Five Only) (Including taxes) per successful De-Duplication.
4. It should be noted, that, subject to "Clause 4 - Non-performance of the Biometric Solution and Rules of Allocation" of Section VIII of the Bid Document, the allocation of further enrolment transactions will be done in accordance with the provisions of "Clause 3 - Rules of Allocation" of Section VIII of the Bid Document.
5. Following salient points, inter alia, as stipulated in "Clause 3 - Rules of Allocation" of Section VIII of the Bid Document should be noted:
 - (i) the enrolment transactions in Cycle 1, i.e. from zero to 1 crore transactions shall be assigned to all the above mentioned three Biometric Solution Providers, meaning, each Biometric Solution Provider shall perform successful de-duplication check on the same 1 crore subjects,

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- (ii) from Cycle 2 onwards, daily volumes shall be allocated separately to Biometric Solution Providers as per "Clause 3 – Rules of Allocation" of Section VIII of the Bid Document.
- (iii) for the purpose of allocation of volumes for Cycle 2, performance of the Biometric Solution during the last Ten Lakh enrolment transactions of Cycle;
- (iv) the performance of the solution of each Biometric Solution Provider shall be measured at the end of each Cycle;
- (v) from Cycle 3 onwards (till Cycle 20), the allocation of volumes to Biometric Solution Provider shall be based on performance measurement made on their respective solution for all transactions undertaken in the previous Cycle.
- (vi) The Biometric Solution of each Biometric Solution Provider shall adhere to performance levels as stated in Clause 7.2 of Section III Attachment 1 – Draft Service Level Agreement of the Bid Document.

6. **Stipulated Time Schedule**

The Project Timelines for Implementation of Biometric Solution shall be as stipulated in "Clause 21 of Section III – General Terms and Conditions of the Contract" of the Bid Document and should be strictly adhered to.

7. **Server, Storage and Other Infrastructure**

In accordance with "Clause 8 of Section V – Scope of Work" of the Bid Document you shall provide hardware for both primary and business continuity sites of UIDAI for de-duplications of an estimated capacity of 1 (one) Crore enrolments. The payment of Rs. 5,00,00,000/- (Rupees Five Crores only) towards delivery, installation, acceptance etc. will be made to you in accordance with "Clause 46 - Payment Schedule" of "Section III – General Terms and Conditions of the Contract" of the Bid Document.

8. **Acceptance of Solution**

It shall be your responsibility to draw the acceptance schedules, detailed acceptance tests, formats for acceptance reports and dissemination mechanism for the acceptance reports in consultation with the UIDAI and as specified in Clause 10 of "Section V – Scope of Work" of the Bid Document.

9. **Training**

As part of system implementation, you shall impart training, to staff of UIDAI and of service providers as nominated by UIDAI, on the Biometric solution related to configuration, usage, API, performance tuning and measurement and Technical reports as indicated in "Section V – Scope of Work" of the Bid Document.

10. **Payment Terms**

Payments will be made to you in accordance with "Clause 46 - Payment Schedule" of "Section III – General Terms and Conditions of the Contract" of the Bid Document.

11. **Scope of Work and Deliverables**

The Scope of work, Deliverables etc. shall be as per "Section V – Scope of Work" of the Bid Document and the Technical Bid submitted by you.

Handwritten signature and date 7-1-2011

Handwritten signature
 M. D. Mehta, MD,
 UIDAI



12. **Warranty**

The Warranty shall be as per the agreement to be signed in this regard, and will be as described in the General Conditions of Contract attached thereto.

13. **Signing of Contract**

Based on your technical and financial bids, and the subsequent discussions held from time to time in this regard, a formal contract would be signed with you. Accordingly, you are requested to come for signing of the formal contract on receipt of this order. Pending signing of the formal Contract, this order shall be governed by the General Terms and Conditions of the Contract, Service Level Agreement and Work Allocation & Service Levels as stipulated in Section II, Section III (Attachment 1) and Section VIII respectively of the Bid Document

14. **Performance Security**

Within 15 days after receipt of this order, M/s L1 Identity Solution Operating Company shall have to furnish the performance security to the UIDAI, in the form of a bank guarantee bond from a Nationalised Bank / Scheduled Bank, for an amount of Rs. 3,38,75,000/- (Rupees Three Crores Thirty Eight Lakhs Seventy Five Thousand only), which shall be equal to 10 percent of the estimated value of the order (comprising of Rs. 5 crores of hardware costs and Rs. 28.875 Crores for estimated maximum 10.50 crore enrolment transactions).

15. **This issues with the approval of the Competent Authority.**

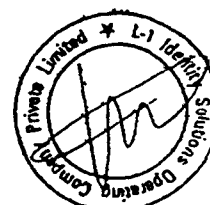
Yours faithfully,

Ajay Nandan
3-11-11
(Ajay Nandan)

Assistant Director General

[Signature]
D. P. Nanavati, DDO
Director, Public Authority of India
Sector 1, Connaught Place, New Delhi-110001

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transactions for a Biometric Solution Provider, during normal operations shall not go beyond fifty percent (50%) of total daily enrolment transactions irrespective of the performance in the previous cycle.

- v. For the purpose of allocation of volumes for Cycle 2, performance of the Biometric Solution during the last Ten Lakh enrolment transactions of Cycle 1 (only the first one crore enrolment transactions) shall be considered.
- vi. The performance of the solution of each Biometric Solution Provider shall be measured at the end of each cycle based on computation of Accuracy, Speed of the solution and Hardware Resources used using test cases provided by UIDAI.
- vii. From Cycle 3 onwards (till Cycle 20), the allocation of volumes to Biometric Solution Provider shall be based on performance measurement made on their respective solution for all transactions undertaken in the previous cycle. Hence, the relative performance of a Biometric Solution in the previous cycle shall determine the allocation of the enrolment transactions for the next cycle.
- viii. The Biometric Solution of each Biometric Solution Provider shall adhere to performance levels as stated in **Clause 7.2 of Annexure C - Service Level Agreement**.

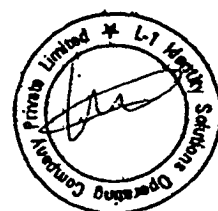
4. Non Performance of a Biometric Solution and Rules of Allocation

- i. Any drop in accuracy of the de-duplication checks by the Biometric Solution Provider below certain limits as specified by UIDAI shall be treated as non performance of the Biometric Solution Provider. The accuracy shall be measured in form of service levels under category 'Accuracy' in **Clause 7.2.1 of Annexure C - Service Level Agreement**. A measurement of service level below the stated limits shall be treated as non performance of the Biometric Solution.
- ii. In the event of non performance by a Biometric Solution due to poor accuracy, as measured using the Service Levels at the end of each cycle, the Biometric Solution Provider shall only receive fifty percent (50%) of volumes it is entitled to in the next cycle, i.e., based on regular computation of allocations across the Biometric Solution Providers in normal operations.



- a. In such a case, the remaining fifty percent (50%) of volumes that would have otherwise been allotted to the non performing Biometric Solution Provider during normal operations shall be distributed equally to other Biometric Solution Providers
 - b. The transfer of enrolment transaction volumes to other Biometric Solution Provider shall add to the volumes allotted to them as per the regular computation during normal operations.
 - c. The limit of maximum allocation to a Biometric Solution Provider as stated in Rule 4 in **Clause 4 – Rules of Allocation** above (maximum of 50%) shall not be applicable in such cases, meaning, a Biometric Solution Provider may receive more than fifty percent of total enrolment volumes in a cycle on account of non performance of one or more of other Biometric Solutions.
- iii. In the event of non performance by a Biometric Solution due to poor accuracy, as measured at the end of each cycle, the Biometric Solution shall be kept under Probation and its performance shall be reviewed at the end of the Allocation Cycle
- a. If the performance, in terms of accuracy, of the solution in the next cycle meets the acceptable service level targets under category 'Accuracy' in **Clause 7.2.1 of Annexure C - Service Level Agreement**, then the Biometric Solution Provider shall be relieved of Probation and shall be allowed to resume normal operations.
 - 1. On resuming normal operations, the Biometric Solution Provider shall be allotted its full share of the allocations for the next cycle as computed across all Biometric Solution Providers.
 - 2. All service levels would be measured as per the criteria to be defined by UIDAI.
 - b. If the performance, in terms of accuracy, of the solution in the next cycle, continues to remain below the minimum acceptable level, then the non performing Biometric Solution shall be moved out of production and kept under Rehabilitation.
 - 1. Under Rehabilitation, the non performing Biometric Solution shall not receive any allocation of enrolment transaction volumes from the next

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B.B. Nanawati, DDC
Member in Charge, Public Authority of India
Ministry of Information and Public Relations
Government of India, New Delhi 110001



cycle onward unless it successfully meets the acceptance criteria of the testing conducted by UIDAI every quarter.

2. In such a case, all the volumes that it was entitled to allotted during normal operations shall be distributed equally to other Biometric Solution Providers.
3. The transfer of enrolment transaction volumes to other Biometric Solution Provider shall add to the volumes already allotted to them.
4. The limit of maximum allocation to a Biometric Solution Provider as stated in Rule 4 in Clause 4 – Rules of Allocation above shall not be applicable in such cases, meaning, a Biometric Solution Provider may receive more than fifty percent of total enrolment volumes in a cycle on account of non performance of one or more of other Biometric Solutions.
5. The performance of the Biometric Solution under rehabilitation shall be reviewed at the end of the quarter by UIDAI by conducting a test using a separate test bed of enrolment volumes. Please refer to the Clause 4.1 - Performance Testing of Biometric Solution for more details
 - The Biometric Solution Provider may choose to undertake the test before the end of the quarter. However, the cost of such early testing shall be fully borne by the Biometric Solution Provider
6. If the non performing Biometric Solution Provider successfully meets the acceptance criteria of the testing conducted by UIDAI, it shall be shall be relieved of Rehabilitation and shall be allowed to resume normal operations by moving into Production.
 - On resuming normal operations, the Biometric Solution Provider shall be allotted 10 Lakhs transaction for the next cycle Biometric Solution Provider
 - a. On meeting the service levels successfully as measured at the end of the cycle. the Biometric Solution Provider shall be given its full share of allocations for the next cycle
 - b. If the Biometric Solution fails to meet the minimum service levels for the allotted 10 Lakh transactions, the contract of the Biometric Solution Provider shall be terminated immediately

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 2.7. Manawati, pps



7. If the non performing Biometric Solution does not meet the acceptance criteria of the testing conducted by UIDAI, the contract of the Biometric Solution Provider shall be terminated immediately. In such a case, UIDAI reserves the right to appoint another Biometric Solution Provider in addition to the existing Biometric Solution Providers

4.1 Performance Testing of Biometric Solution

ABIS will be tested on performance using continuous and period testing.

Continuous Testing: Continuous testing shall cover measurements for the following parameters:

1. Speed: throughput rate per day
2. Hardware utilization: utilization of hardware for quality check, template generation, insertion and de-duplication (IDENTIFY method) each
3. FMR and FPIR

Periodic Testing

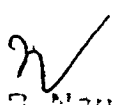
The periodic testing will involve use of probes with known duplicates and non-duplicates to measure FMR, FNMR, FPIR and FNIR. Prior to probes, the vendor will be provided sufficient training data to tune ABIS. It is the intention of UIDAI to generate near continuous "probe" data to generate continuous FNMR and FNIR.

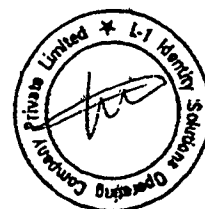
Each ABIS will be expected to perform with an accepted band of performance in each of three dimension — Speed, accuracy and resources (H/W, power, DC space etc.). If any ABIS crosses acceptable band, reallocation of the workload will be triggered.

The reallocation of workload, subject to conditions listed above for the SLA, will be based on accuracy, speed and resource optimization. The basic principle governing relocation is to optimize accuracy while maintaining requisite speed for a given configuration. The precise formula will be provided at the time of the reallocation event. UIDAI reserves the right to change the governing principle if operating constraints are changed

5. Service Level

For details of Solution related performance levels, please refer to Clause 7.2 of Annexure C - Service Level Agreement.


 D.S. Nanawati, Secy
 Ministry of Home Affairs
 Government of India
 New Delhi-110001



Annexure E

Scope of Work



E. B. Nanawati, pp.

Scope of Work

1 INTRODUCTION

1.1 Objective

The aim of this Request for Proposal is to select three Biometric Solution Providers to design, supply, install, configure, commission, maintain and support (a) multi-modal Automatic Biometric Identification Subsystem (ABIS) and (b) multi-modal Software Development Kit (SDK) for client enrollment station, verification server, manual adjudication and monitoring function of the UID application.

1.2 Background

The UIDAI has been setup by the Government of India with a mandate to issue Unique Identification numbers (UID Numbers) to all the residents in the country. UIDAI proposes to create a platform to enroll the residents of the country, issue UID Numbers. These numbers may then be used for authentication. This can be used by several Government and private organizations for better delivery of services to residents.

1.3 Intent of UIDAI

The purpose of the UIDAI is to issue UID Numbers that are (a) robust enough to minimise / eliminate duplicate and fake identities, and (b) can be verified and authenticated in an easy, cost effective way. UIDAI will use common demographic and biometric data for establishing and verifying identity, therefore, it becomes essential to standardize these data fields and verification procedures across its registering partners (Registrars). This will aid interoperability across many systems that capture information and work with the residents.

UIDAI has selected biometrics as the primary method to check for duplicate identity records. In order to ensure that an individual can establish their identity uniquely in an easy and cost-effective manner, it is essential that the captured biometric information is of a quality and standard that is capable of being de-duplicated. Further, for authentication of identity at the time of service delivery by Government and private organisations, it is essential that the biometric information capture and transmission are standardized across all users of the UID Application.

In order to set these standards two committees were set up by the UIDAI. The Demographic Data Standards and Verification procedure Committee constituted under by UIDAI and the Biometrics Committee have submitted their final reports. These reports are available on the UIDAI website <http://uidai.gov.in>.

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B.B. Nanawati, oec
Director, UIDAI
Ministry of Home Affairs
Government of India
New Delhi



1.4 Understanding UID System

India will be the first country to implement a biometric-based unique ID system on such a large scale. The UID will serve as a universal proof of identity, allowing residents to establish their credentials anywhere in the country. It will give the Government a clear view of India's population and enable it to track and deliver services and resource flows effectively, thereby achieving greater returns on social investments. Confirming 'you are who you say you are' remains the primary, often elusive goal of all identity systems.

The UIDAI approach – which will be online authentication, with biometric check – creates a very strong authentication system, and gives the UIDAI significant ability to confirm an individual's identity. The UIDAI will support the Registrars in building the infrastructure and systems necessary to authenticate residents in different parts of the country. This will be especially critical for Registrars working in rural areas and among the poor.

1.5 Goals of UID System

For details on the goal of UID system, refer to the document on UIDAI's website titled "Creating a unique identity for every resident in India - Draft approach" <http://uidai.gov.in/documents/Creating%20a%20unique%20identity%20for%20every%20resident%20in%20India.pdf>

1.6 Key Features of UID System

1. Identity – every resident can have a lifelong ID number that will be commonly accepted across multiple systems within India. That number will be linked to limited demographic information, such as name, residence, date of birth and gender, establishing an official "identity" for each resident.
2. Authentication – Is the process of ascertaining a person's identity, supports answering the basic question "is a resident the person he/she claims to be".
3. Standardization – Standardization of Know Your Resident (KYR) Data and Processes, and Biometric Standards in order to achieve interoperability across organizational users of the system.

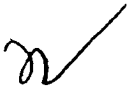
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1.7 Glossary

Table 1 – Glossary

Term	Definition or Meaning
UIDAI	The regulatory body that will design, develop, and deploy the UID Application with the help of service providers
Registrar	Any Government, private or non-Governmental agency that can enroll and authenticate residents using the UID Application.
Enrolment Agency	The agency that will actually enroll residents by capturing their demographic and biometric information in the field. They will be setup or employed on behalf of the Registrar
UID Server	The central server that responds to enrolment and authentication requests.
Registrar System	The registrars IT systems and processes
Enrolment Client	Software provided by the UIDAI to Registrar/Enrolling Agencies in order to enrol residents into the UID system.
Biometric Solution	Consists of two biometric components: ABIS and multi-modal SDK.
ABIS API	API to communicate between UID Application & ABIS.
BSP	Biometric Solution Provider supplying biometric solutions (ABIS and multi-modal SDK).
MSP	Managed Service Provider
CIDR	Central Identity Repository, which is the database and de-duplication/verification application
BCP	Business Continuity Planning
Verification	The process of comparing a query biometric sample to a stored biometric reference to determine if they came from the same person
Authentication	The process of validating a claim that a UID number belongs to a particular resident using biometric or non-biometric means
UID Application	UID Software for enrolment and authentication. In the current context, it is used to indicate non-biometric portion of UID software. Occasionally, it is a synonym for UID server.
Scaled fusion	Score of similarity returned by ABIS. Also called normalized fusion


D.B. Nanawati, DDC

Secretary, Ministry of Information & Public Relations
Government of India
New Delhi-110001



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Term	Definition or Meaning
score	score. It ranges between [0 and 100] where 100 is most similar and 0 is least similar.
SDK	Software Development Kit comprises of computational algorithm for quality analysis, segmentation, feature extraction, comparison score generation for fingerprint, iris and face modalities.

2 STAKEHOLDERS

2.1 Unique Identification Authority of India (UIDAI)

UIDAI has been setup by the Government of India with a mandate to issue Unique Identification numbers (UID Numbers) to all the residents in the country. It is regulatory body responsible for the success of the entire project.

2.2 UIDAI Technology Team at Bengaluru:

The technology team works under the direction of UIDAI to design, develop and advise on the technology solution.

2.3 Biometric Solution Provider (BSP)

A BSP shall work under the direction of the technology team to design, supply, integrate, install, commission and maintain the biometric solution.

2.4 Project Management Consultant (PMC):

✓ PMC shall assist UIDAI in defining the scope of services and selecting BSP and Managed Service Provider, in selecting data center and providing overall project management of the CIDR project. M/s Ernst & Young Pvt Ltd has been selected as the PMC.

2.5 Application Software Development, Maintenance and Support Agency (ASDMSA):

ASDMSA provides application software development and maintenance services for the UID application. ASDMSA will develop biometric based enrollment software. ASDMSA will develop and assist in testing biometric solution interface. M/s Mind Tree Ltd. has been selected as ASDMSA.

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2.6 Project Management Unit (PMU):

UIDAI has set-up a Project Monitoring Unit (PMU) at its headquarters, to monitor the timely and effective implementation of the project. The PMU will be responsible for the overall planning and execution of the UID project, under the guidance of UIDAI.

2.7 Managed Service Provider (MSP)

MSP operates data center, manages UID application, is responsible for overall operation and logistics and supports registrar on-boarding. MSP is expected to be selected in October 2010.


2.8 Data Center (DC)

The entire UID application, with the exception of the enrollment centers and authentication request stations, will be housed at the Data Center (DC), initially a single physical center, but potentially dividing into multiple centers during the course of the project. The DC will provide infrastructure facility, off-site backup storage and support movement of physical material between DC and Disaster Recovery Center.

3 UID SYSTEM OVERVIEW

3.1 High Level System Overview

The UID Server System consists of the UID application existing within a cloud computing environment. UID Server System is deployed centrally on one or distributed over many data centers and provides various services over a secure network. Main application modules are "Enrolment Module" and "Authentication Module". In addition, various other modules for administration, analytics, reporting, fraud detection, portal user interface, etc. are also part of the UID Server System.


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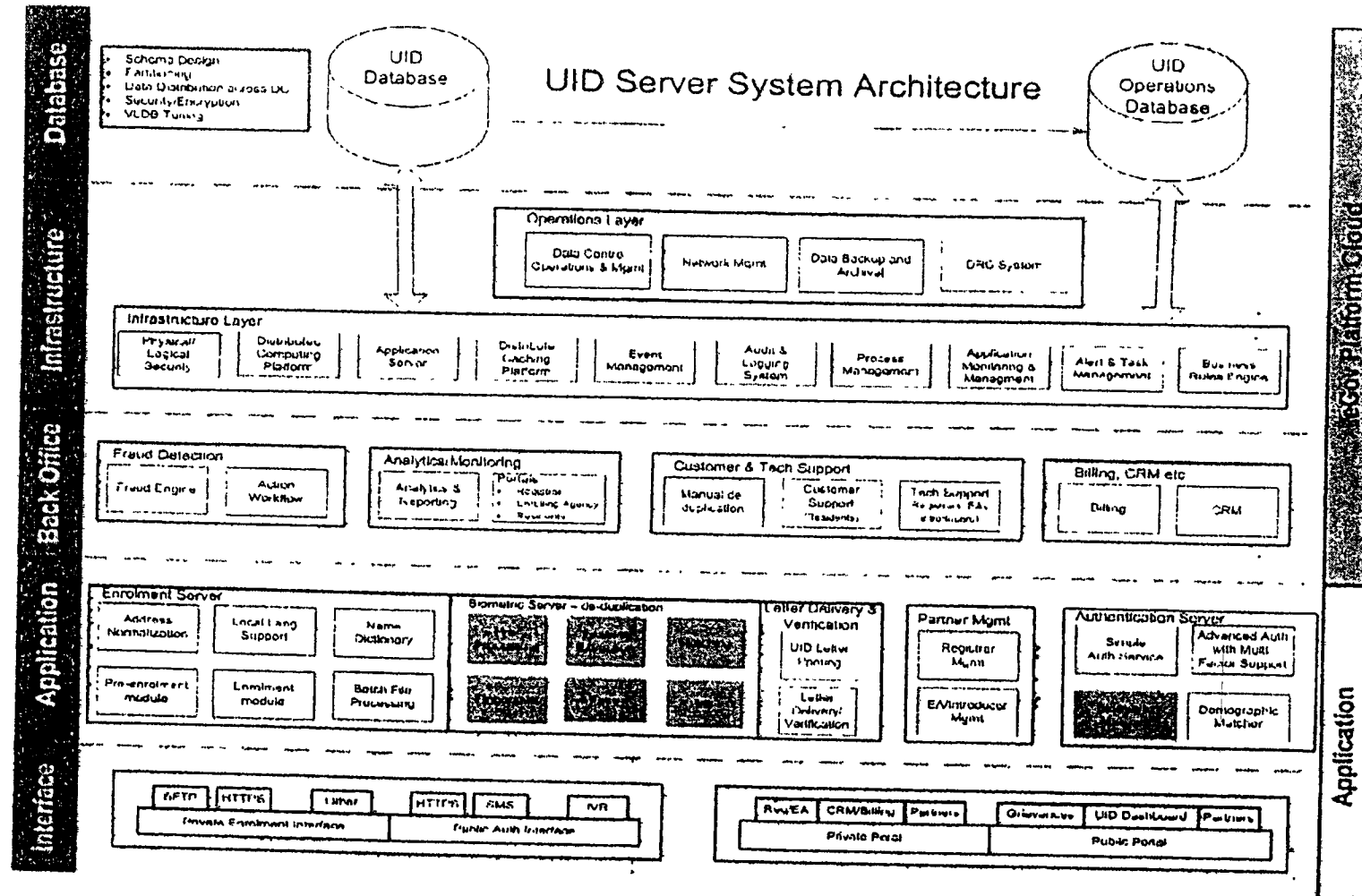


Figure 1 - UID Server System

(Orange boxes indicates components to be provided by the BSP)




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On the other hand, UID Enrolment Client is a rich client application that can be deployed on a large number of computers in the field and works in offline disconnected mode. Enrolment agencies will use the client software within their systems to enrol residents in the field and upload data onto the server in a batch mode. The BSP will supply only an SDK (described later in this document) that is will be embedded in the Enrolment Client.

3.2 Biometric Solution Design Principles

1. **Modularity:** The design must allow for replacement and updating of components, perhaps from various vendors, without any impact on the remaining components. The components in this context should be as fine grained as possible. For example, the enrolment server and authentication server are fully decoupled and will use separate database and could use different matcher.
2. **Standards:** Use of the standards prescribed by UIDAI is mandatory. All interfaces to the outside systems must be based on current industry standards adopted by UIDAI for maximum interoperability. Use of open source also aids in standardization.
3. **Avoidance of vendor lock-in:** In the area of biometrics, proprietary algorithms and data representation are perhaps required to achieve performance and accuracy requirements of the UIDAI. The system is designed such that these algorithms and data representation form a part of the black box, and the entire box or a sub-system can be replaced without any impact on the other biometrics black boxes. For example, one can replace biometric de-duplication module without any impact on the biometric verification module. All proprietary data formats needed within each solution are not exposed outside of the black box.
4. **Resident Convenience:** The entire process of enrolment and authentication must be conducted with strict conformance to quality and precision. At the same time, the process will provide transparency, flexibility and convenience to the residents. For example, the collection of biometric features will have user interface that is consistent with these requirements.
5. **Risk Mitigation:** India is the largest country to undertake biometric collection of the entire population and biometric authentication for service delivery. BSPs are yet to build systems on such a scale. Consequently it is not possible to predict scalability of the present offerings against the demographics of India. As the quality and availability of biometric measures across the population is currently not known, alternate methods for de-duplication and fall-back strategy must be incorporated in the design should the primary strategy fall short of the UIDAI goals.


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 UIDAI



6. **Universality:** To support scalability and inclusiveness of the solution, three biometric modes will be collected fingerprint, face and iris. Ten fingerprints will be collected as "slaps" ("4-4-2"). Iris images will be collected in pairs and facial image will be full frontal. The deduplication should utilize fingerprint and iris images.
7. **Security:** Biometric Solution must be secure and conform to Government of India's data security and UID's security guidelines, including encryption and decryption. For example, all personal information stored on a permanent storage media must be encrypted.
8. **Enrolment data quality:** The quality of data depends on enrolment process and technology. UIDAI will use best practices for enrolment process and utilize optimum technology to capture best quality of data while ensuring that no one is denied enrolment due to poor biometric data. A number of techniques such as operator enrolment and verification of enrollee's biometric against all registered operators and supervisors will be performed at the enrolment station.
9. **Service Oriented Architecture:** The biometric components follow SOA principles. They provide specific services using well defined interfaces.
10. **Isolation.** ABIS will not have access and should not try to access any network resources except the resources referenced by the URLs provided through the API.
11. **DBMS –** The DBMS should be compatible with RDBMS of UID application and should be able to import/export data with ease
12. **Distributed Database –** Solution should provide distributed database for the purpose of authentication

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Director, Technical Services
Ministry of Information & Public Relations
Government of India, New Delhi-110002



3.3.1 Enrolment Process Information Flow

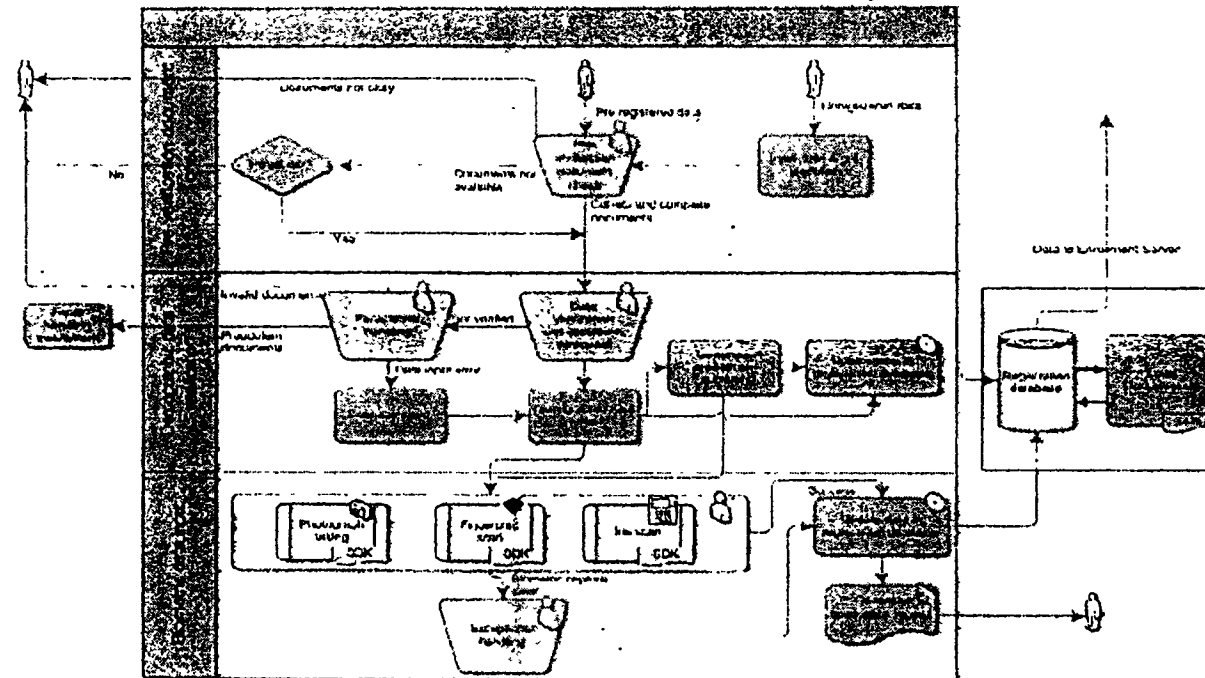
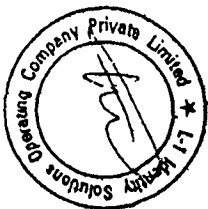


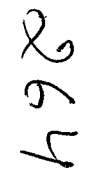
Figure 3 - UID Enrolment Process Information Flow (Orange indicates components to be provided by the BSP)

The UID enrolment client is a rich client application being developed by the UIDAI. Further details of the information flow can be found in ASDMSA Volume II. The BSP will provide SDKs to support the collection, pre-processing and matching of face, iris and fingerprint data



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Dr. Manjivati, Doc
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The enrolment server is a logically centralized system running on the e-governance cloud. Further details of the information flow can be found in ASDMSA Volume II. The BSP will be fully responsible for the biometric de-duplication module within the Biometric De-Duplication Layer (Layer 2 in Figure 4), including maintenance of a de-duplication database and a physically separated and synchronized disaster recovery database.

3.4 Authentication Server

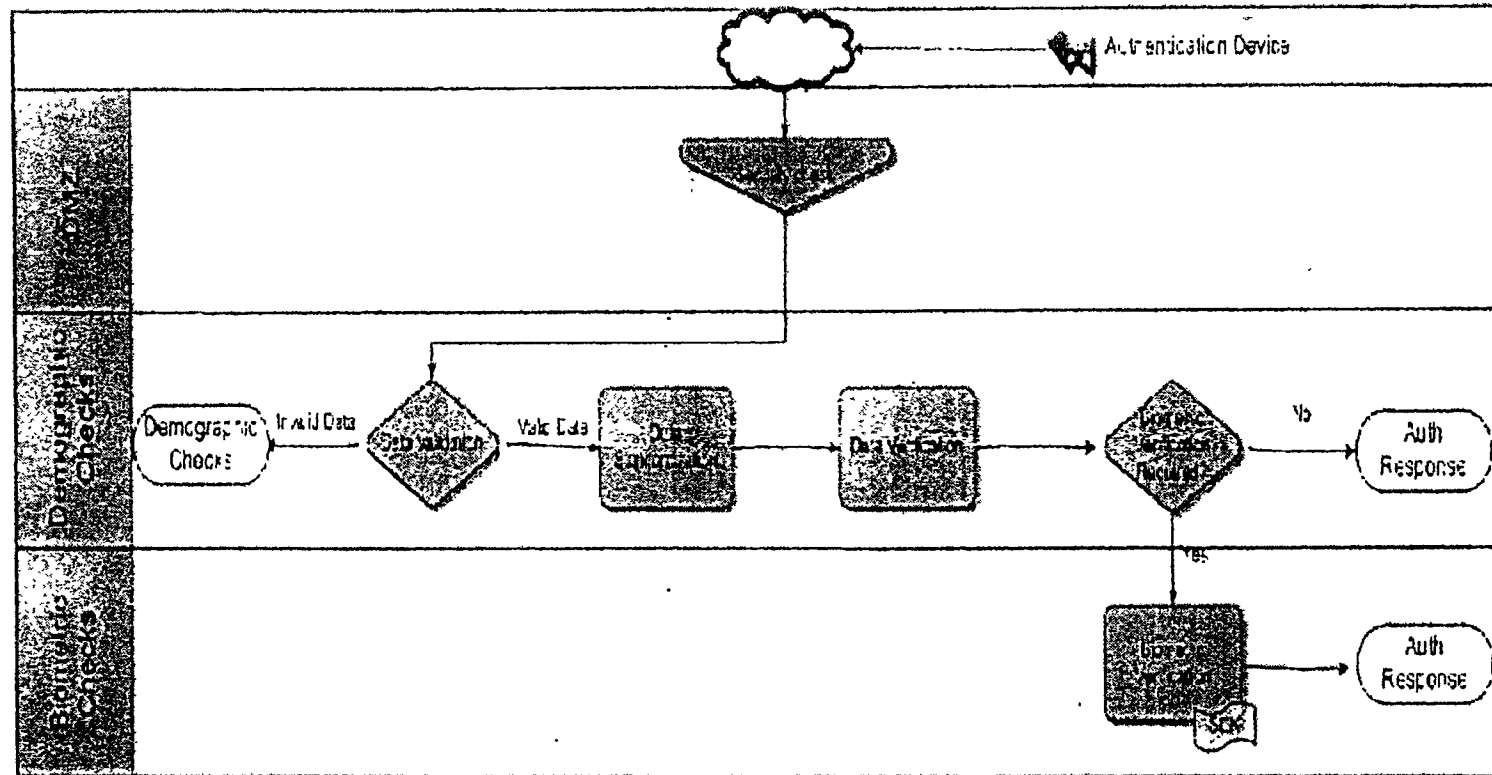
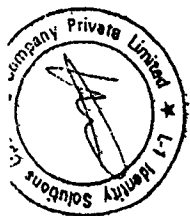


Figure 5 Authentication Server Information Flow

(Orange and yellow indicate components to be provided by the BSP)



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Online authentication, to validate the residents' claim to UID numbers at points of service, is supported by the UID system. Approaches to verification can be flexible to accommodate different levels of assurance:

- Online demographic authentication, where the authenticating agency compares the UID number and demographic information of the UID holder to the information stored in the UID database. The assurance level here is medium and does not involve the BSP.
- Online biometric verification where the biometrics of the UID holder, his/her UID and key demographic details are compared to the details in the CIDR. The comparison of submitted biometric samples to stored biometric references to support this process will be the responsibility of the BSP. The assurance level in this case is high.

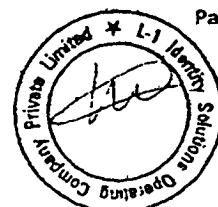
UIDAI expects an extremely large volume of verification requests each day once the UID number is widely adopted within various systems across the country. To cater to such large volumes, all verification requests are "stateless", containing all information required for the verification transaction within each request message. This means that no "state" should ever be maintained on the server and every request should be serviced as if it is a new request. Authentication clients should maintain necessary state during interaction with the resident to allow error handling, retries, and overall provide a friendly experience to residents.

4 BIOMETRIC SOLUTION COMPONENTS

Two biometric components are utilized in five modules of the UID System. The biometric components are:

- ✓ 1. Automated Biometric Identification Subsystem (ABIS): ABIS will be used in the Enrolment Server as a part of the multi-modal biometric de-duplication solution. In the early release, ABIS will also be used in the Authentication Server for verification. The ABIS will maintain its own database of proprietary fingerprint and iris templates for de-duplication (and face templates at the discretion of the vendor), and must be able to respond to verification requests accompanied by fingerprint and/or iris images, as well as ISO/IEC 19794-2:2005 format fingerprint minutiae files. Vendors will work with the UIDAI to provide further specification within 19794-2 to promote interoperability with future verification clients.
2. Multimodal SDKs: SDKs will be used in the enrolment client, manual check (for duplicates), authentication server (for later releases) and the analytics module. The SDK may contain signal detection, quality analysis, image selection, image fusion,

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 to the Director, UIDAI
 Government of India
 New Delhi



segmentation, image pre-processing, feature extraction and comparison score generation for fingerprint, iris and face modalities.

In summary, the following UID System modules utilize biometric components:

1. Multi-modal de-duplication in the enrollment server
2. Verification subsystem within the authentication server
3. Enrolment client
4. Manual checks and exception handling
5. Biometric sub-system monitoring and analysis

The functional requirements of the five areas are described, followed by the overall functions of the two biometric components.


4.1 UID System Requirements of the biometric components

4.1.1 Multi-modal Biometric de-duplication in the Enrolment Server

Considering the expected size of the de-duplication task, the UID enrolment server will utilize:

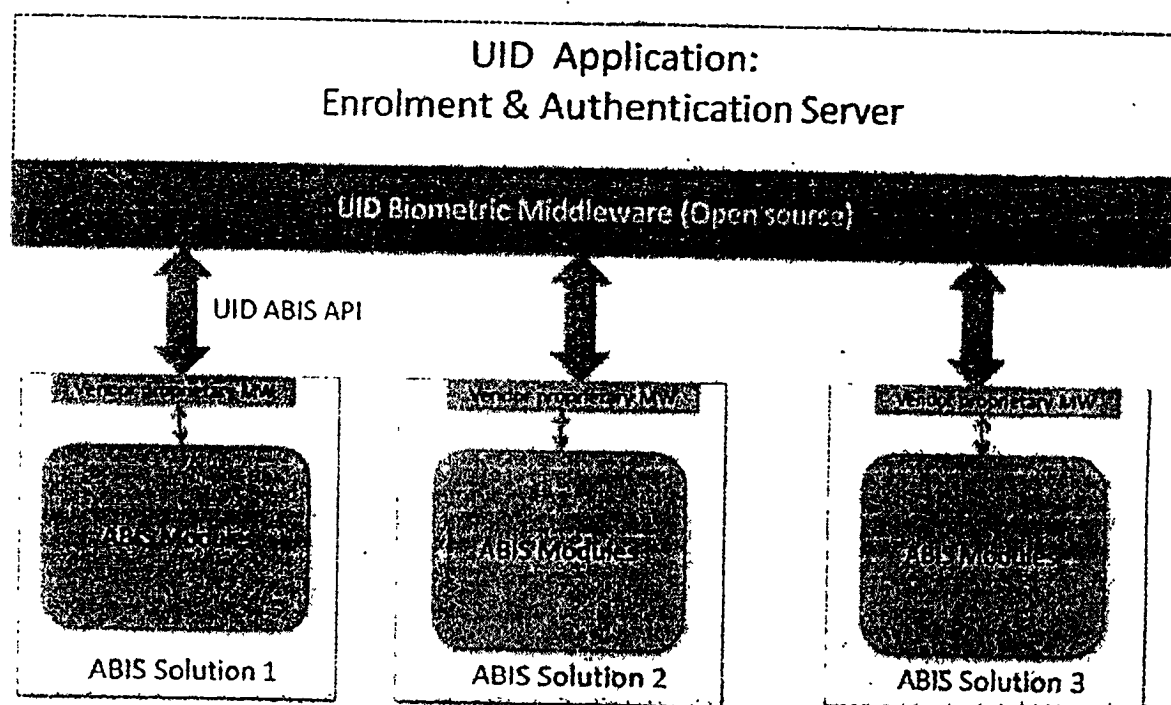
1. Multi-modal de-duplication. Multiple modalities – fingerprint and iris will be used for de-duplication. Face photograph is provided if the vendor desires to use it for de-duplication. *While certain demographical information is also provided, UIDAI provides no assurance of its accuracy.* Demographic information shall not be used for filtering during the de-duplication process, but this capability shall be preserved for potential implementation in later phases of the UID program. Each multi-modal de-duplication request will contain an indexing number (ReferenceID)¹ in addition to the multi-modal biometric and demographic data. In the event one or more duplicate enrolments is found, the ABIS will pass back the ReferenceID of the duplicates and the scaled comparison scores upon which the duplicate finding was based. The scaled fusion score returned with each duplicate found will have a range of [0, 100], with 0 indicating the least level of similarity and 100 as the highest level of similarity.

¹ ABIS will not be aware of the UID #, nor will it be aware of how UID # maps to reference ID or records in the reference DB.


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Group, UIDAI
Ministry of Home Affairs, Government of India



2. Multi-vendor. Multiple complete multi-modal solutions from more than one vendor will be used as shown in



3. Figure 6. The UID Application will determine routing of a particular de-duplication request. It may determine to route a particular de-duplication request to more than one biometric solution. If it routes a de-duplication request to more than one solution, it is responsible for determining the final outcome of the de-duplication request. In other words, fusion of the scores across the multiple ABIS is not within the scope of this RFP. The UID ABIS API specifies the interaction between UID Application and ABIS.

The middleware included in the UID application (being developed by ASDMSA) is meant to provide vendor independence and standardization. The key features of the middleware is

- Routing and mediation.
- Guaranteed delivery
- Fault tolerance and load balancing
- Open standard based messaging (AMQP) using open source RabbitMQ

- e. Transparent connectivity to analysis and system monitoring modules of UID applications
- f. Support of web 2.0 based UID ABIS API and CBEFF data format standard
- g. Encapsulation and isolation of ABIS components

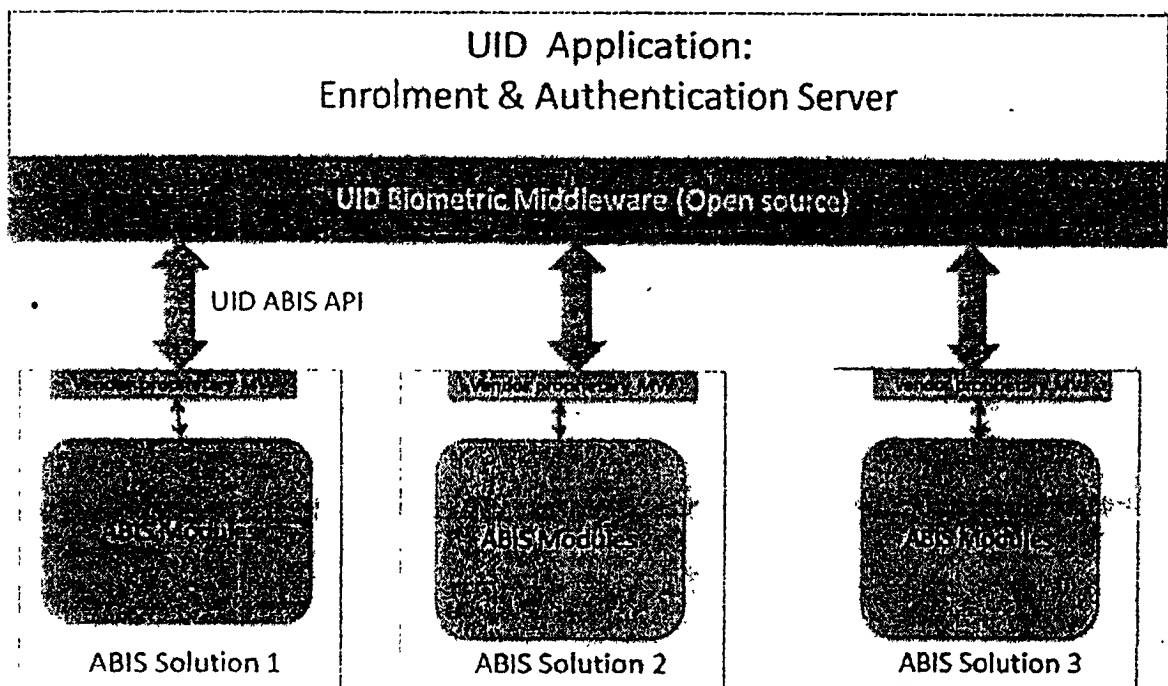


Figure 6 Authentication Server De-duplication

(Orange indicates components to be provided by the BSP)

4.1.2 Verification Subsystem of Authentication Server

In the first release of the UID server, the biometric verification module, as shown in Figure 7, provides verification *within* the authentication server. The solution should be capable of 1:1 verification comparisons of enrolled references with incoming ISO/IEC 19794-compliant fingerprint, iris or face images or 19794-2 compliant fingerprint minutiae sets without proprietary extended data. Figure 7 illustrates both the verification and de-duplication subsystems to be supplied by the BSP.

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Ministry of Information and Public Relations
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For the purpose of distributed authentication by UIDAI at a later stage, the biometric verification module may be constructed using SDK. While the functionality of the verification subsystem will not change, the internal architecture may change. The templates will be maintained in memory resident database by the UID authentication server application (not in scope of BSP). If the incoming requests contain a biometric image, the Authentication server will use SDK to extract the feature. SDK will also be used to generate comparison score of the sample. The decision for distributed authentication will rest with UIDAI and will be binding on the BSP

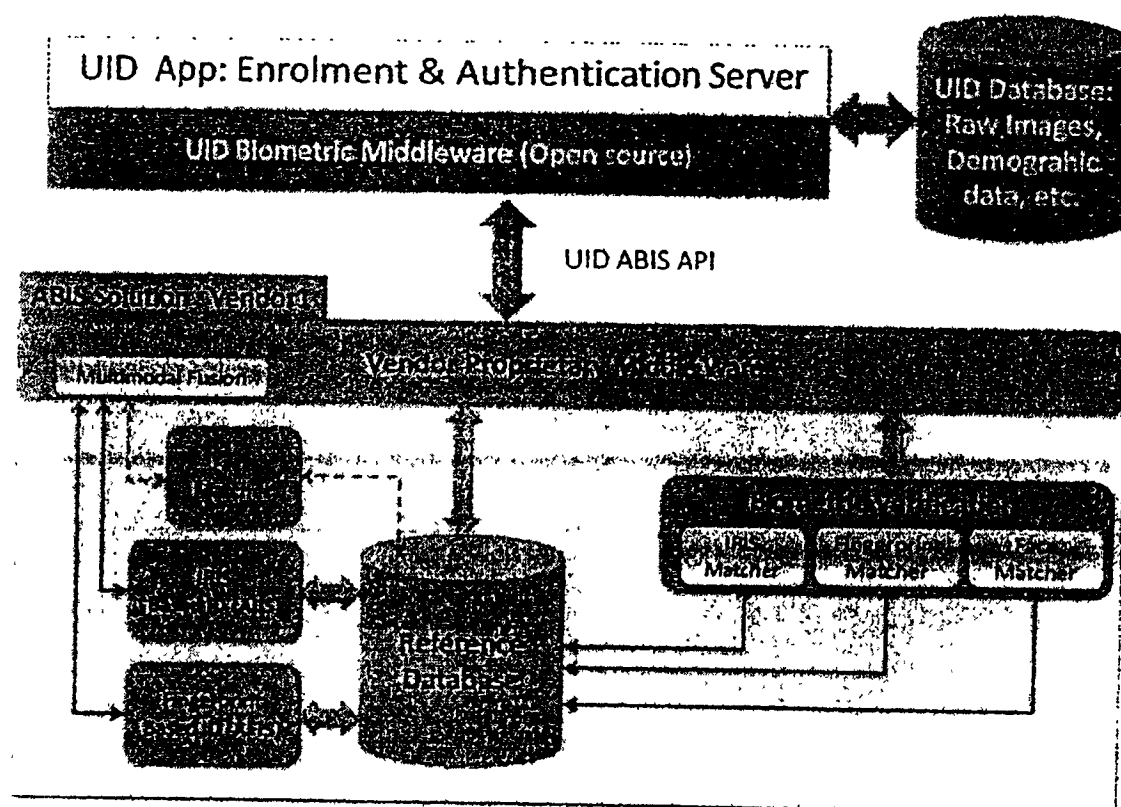


Figure 7 Verification and De-duplication Server
(Orange indicates components to be provided by the BSP)

4.1.3 Enrolment Client

The multimodal SDK to be supplied by the BSP should include the following functions

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1. Fingerprint Slap Segmentation / Sequence Check. Upon fingerprint image capture, it may be required to check if the correct slap was captured, and also segment it into each digit.
2. Quality check. Each modality image requires checking for capture quality to initiate re-capture if needed and provide actionable feedback (such as guidance on finger repositioning) to the operator.
3. Image enhancement. Face photos may require image enhancement such as auto cropping and auto rotation to meet industry standard. Iris images may require cropping to KIND_CROPPED (formerly called Kind 3) or KIND_CROPPED_AND_MASKED (formerly Kind 7) format. No gray-level image alteration will be allowed.
4. Feature extraction. In a number of cases, fingerprints, faces and/or irises will be matched locally. Such cases include verification of operator or supervisor authorizing override requests and local de-duplication of enrolled images. The client software will need to extract features locally. If sufficient features cannot be extracted, the client software may require re-capture.
5. Template generation. In a number of cases, fingerprints, faces and/or irises will be matched locally. Such cases include operator and supervisory override and local de-duplication. The client software will need to generate template locally.
6. Compression and format conversion. The image may have to be converted from one format to another (example, BMP to .PNG) or may have to be compressed/decompressed (WSQ or JPEG 2000) prior to storage.
7. Identification (1:N_{few}). To reduce fraud and prevent unintentional errors, the client software will perform 1:N_{few} identification. A typical case of such identification is to ensure that the same person does not return to the same enrolment station within a short period of time. This includes fingerprint, face and iris. Another scenario pertains to supervisor override during which the supervisor's fingerprint will be captured and verified. In such cases N is expected to be of the order of a few thousands.

One or more SDK libraries will be used to support enrolment client requirements.

4.1.4 Adjudication and exception handling

In the event of a duplicate determination during enrolment, or in small number of cases when the biometric solution is not able to make a clear "duplicate/no duplicate" decision, images and enrollment data will be sent for manual check. The Adjudication workstation is part of the UID application and is outside the scope of current RFP. However, the

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workstation needs certain biometric functions that are provided by the SDK. The workstation will need access to the functions described in Clause 4.1.3.

4.1.5 System Monitoring & Analysis

The system monitoring and analysis modules of UID application require information from the enrolment and authentication system to perform the following:

1. Monitor comparison score distributions
2. Monitor quality of the input data
3. Compare performance and analyze de-duplication risk across parallel ABIS systems.
4. Metrics helpful in analysis of possible enrolment/verification fraud and system intrusion

BSP is expected to assist ASDMSA and MSP to design and implement above functionality and do troubleshooting and resolution of issues.

4.2 Biometric Components

BSP is required to provide ABIS including but not limited to middleware, reference database and fusion algorithms as per requirements indicated in clause 6.2.


BSP shall also provide a separate multi-modal SDK for:

1. Authentication
2. Enrolment client
3. Adjudication and
4. System Monitoring and Analysis

Please refer to clauses 6.2 and 6.3 for more details on ABIS and Multimodal SDK respectively

✓ 4.2.1 Automated Biometric Identification System (ABIS)

ABIS used in the Enrolment Server and Authentication Server should provide de-duplication and verification functions. It should communicate with the UID System through the UID Biometric API. As per API specifications, ABIS provides the following functions


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South African Police Service
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Management	Enrolment	Authentication
Shutdown	Insert	Verify
Clear	Identify	Ping
Ping	Delete	
GetPendingRequests	Ping	
GetReferenceCount		

Each ABIS shall maintain its own database of indexed biometric references (called the reference database) as well as a synchronized disaster recovery database at a separate physical location. This reference database is separate from UID database that is outside of ABIS and not accessible to ABIS. All information necessary for ABIS to perform its functions is maintained by ABIS in the reference database.

ABIS is expected to use both fingerprint and iris for de-duplication. The BSP may choose to use face photo¹ for de-duplication within the ABIS as well.

CLEAR and SHUTDOWN methods have additional level security and can be sent to the ABIS by the UID application only after careful validation of the authorizations of the requesting party.

4.2.2 Multimodal SDK:

The SDK is a set of libraries that provide following functions and should be provided and kept updated with patches and upgrades.

4.2.2.1 Fingerprint

1. Slap Segmentation / Sequence Check
2. Quality check with actionable feedback
3. Image compression/de-compression
4. Feature extraction & Template Generation
5. Identification (1:N_{few})
6. Verification (1:1)

¹ While the objective is to capture face photo per ICAO standard, there is no assurance that consistency could be maintained due to diverse capture conditions.

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 Planning & Development Division, Bharat
 Chauri Chauri, New Delhi - 110001



4.2.2.2 Iris

1. Quality check with actionable feedback
2. Segmentation/cropping
3. Image compression/de-compression
4. Feature extraction & template generation
5. Identification (1:N_{few})
6. Verification (1:1)

4.2.2.3 Face Photo

1. Automatic capture
2. Quality check with actionable feedback
3. Image enhancement (cropping and rotation)
4. Image compression/de-compression
5. Feature extraction & template generation
6. Identification (1:N_{few})
7. Verification (1:1)

Although automated face recognition is optional within the ABIS, this capability will be required of SDKs for various applications, such as Adjudication and exception handling.

BSP shall supply the UIDAI with a perpetual, fully paid-up, enterprise/world Server and Desktop license to use the BSP's proprietary Multimodal SDK for use within the applications developed by UIDAI or by its authorized contractors/subcontractors for the purpose of the UID Program. As provided in L-1 Identity Solutions Operating Company's licensing policy in its Technical Bid, the Purchaser (including its authorized contractors/subcontractors) are permitted to: (a) make and install copies of the Multimodal SDK software on Purchaser owned or controlled server and desktop computer system hardware (the "System" or "Systems") located at UIDAI owned or controlled facilities; (b) use the Multimodal SDK software and related documentation for the Purchaser's own internal use in developing 1:1 and 1:few custom solution applications (the "UIDAI Custom Applications") containing Multimodal SDK software components in furtherance of the UID Program; (c) use the UIDAI Custom Applications solely in furtherance of the UID Program; (d) publicly demonstrate the UIDAI Custom Applications on Systems; and (e) make and deploy copies of the UIDAI

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Custom Applications to government and non-government entities and grant such parties a limited sublicense to use the UIDAI Custom Applications solely in furtherance of the UID Program. The Purchaser will require its authorized contractors/subcontracts that support the Purchaser with developing applications from the Multimodal SDK to execute confidentiality agreements that protect the confidential nature of L-1 Identity Solutions Operating Company's proprietary Multimodal SDK.


4.2.2.4 SDK API (planned)

In the first release of UID Application, SDK will be invoked using its native API. A service oriented vendor independent API for SDK is planned to be released in July 2010. The vendor will be required to provide update to the SDK compliant with the SDK API after the release of the API.

5 GUIDING FACTORS FOR THE BIOMETRIC SOLUTION

Various UIDAI administrative policies will impact the design and operation of both the ABIS and the enrolment stations. In this section we enumerate the current policies.

1. Generally identification function can rely on the sequence of the fingerprint and eyes. However in the case that there are missing fingers, extra fingers, hand abnormalities or when the confidence of the segmentation is low, the identification should not rely on the sequence of the fingers.
2. Iris images will be automatically labeled by the capture device as left or right and therefore this label may be used to restrict iris searches for de-duplication.
3. The ABIS system should not restrict the search on the basis of demographics (gender, age, location) initially, but this capability should be preserved for potential insertion at a later stage in the program.
4. With regard to slap fingerprints, search outcome should not be impacted by inversion of thumb placement.
5. Face photo image enhancement at the enrolment stations may include cropping and rotation, but must not include non-reversible gray-level alterations (i.e., pose and illumination normalization).
6. The ABIS system must create a record in the reference database whenever UID Application invokes INSERT method regardless of biometric image quality.


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 Director, UIDAI
 Government of India



7. With the growth of the database, UIDAI may require the vendor to enhance or replace algorithm. The ABIS should be structured to allow for replacement, enhancement or insertion of new algorithm.
8. De-duplication flow over multiple modality can be chosen by the vendor. However, UIDAI may upon review of results, may require that vendor must perform de-duplication on both modalities fully.
9. Authorizations for all requests will be verified at the UID application level. Therefore, all requests sent by the UID application to the ABIS can be assumed to be from an authorized source.

6 MINIMUM REQUIREMENTS OF SOLUTION

6.1 System Architecture Requirements

6.1.1 Scalability


Dynamic or rule based ability to scale the system within servers, across servers without inherent bottlenecks and code changes. Ability to scale across data centers.

- The system shall have ability to scale dynamically within a server depending upon the load.
- The system shall have ability to add nodes dynamically without bringing the system down.
- The system shall have ability to utilize dynamically increased CPU, RAM and storage.
- The system shall have ability to utilize network bandwidth provided through multiple interfaces.
- The system shall have ability to load balance across servers
- The system should not have a single point of failure and inherent design bottlenecks that stops it from scaling.

6.1.2 Security

Ability to secure all data from thefts, tampering, unwanted modifications, network attacks, and other security threats using physical and logical measures as per UIDAI specified security and data protection policies.

The solution shall support:


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District Collector, District of
Chandigarh, Chandigarh



- storing primary data in encrypted fashion
- profile based encryption schemes
- secure communication protocols while communicating with external components
- Communication with only the UID application.
- only authorized users to access appropriate data
- changing the encryption schemes dynamically periodically
- integration with external security components
- configuring Access Control Lists
- running services without super user privileges
- Auditing all access and modifications (by any user) to biometric data and make these audit trails available. Audit trail should be stored

6.1.3 Interoperability

Ability to interoperate with other systems/services within and across any open interfaces and ability to continually re-factor and/or replace specific components without affecting rest of the system.

The solution shall support: -

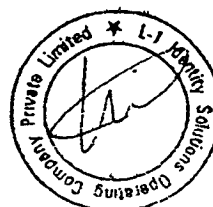
- the open standard protocol based communication
- command line based interface for interaction
- re-factor/replace individual services without bringing the whole system down.
- all APIs and interfaces defined by UIDAI as part of biometric vendor integration specifications.
- automated integration from external management products such as systems management, network management, and other tools

6.1.4 Manageability

Ability to manage end-to-end solution and its components to ensure solution health and SLAs using external data center management tools.

The solution shall support:

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 P. P. Manojkumar, CEO
 UIDAI



- monitoring of its services using management tools
- ability to bring its services up and down
- monitoring its CPU/network/storage utilization
- monitoring the response time of individual services
- maintenance of its services without affecting client access
- continuous availability of its services even during regular management activities

6.1.5 Availability

Ability of the solution to be up and running over long periods of time and ensure continuous availability.

The solution shall support:

- high availability of its services across servers and DC
- integration with technologies that provide application high availability
- integration with technologies that provide data replication to have data high availability
- continuous availability of its services even during regular management activities


6.1.6 Upgradeability

Ability to seamlessly upgrade services, components, and modules without affecting services and open interfaces. Ability to upgrade without bringing down the solution.

The solution shall support:

- upgrade of individual modules without bringing the solution down.
- backward compatibility
- upgrading using third party software delivery systems
- reverting back to original configuration in case of an upgrade failure
- reverting back to old configuration after a successful upgrade

6.1.7 Installation and Configuration


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Authorized Signatory
Private Limited
Operating Company



Ability to configure the solution using wizard and other end user tools. Ability to install the solution using install script.

The solution shall support:

- integration with change management system
- integration with software delivery systems
- installation and configuration without super user privileges

6.1.8 Maintainability

The solution shall have the:

- Ability to continuously maintain, enhance, re-factor solution without breaking other parts.
- Ability to support maintenance, enhancement and refactoring the solution without breaking other parts

6.1.9 Open Standards Based

Technology choices should be based on open standards and widely adopted frameworks as long as they meet the needs of the system.

The solution shall have:

- technologies that are based on open standards
- frameworks that are widely adopted

6.1.10 Cloud Enabled

Technologies that support deployment on a virtualized platform.

The solution should support:

- The ability to deploy and run the application within a private cloud platform to take advantage of next generation cloud features.
- running services in virtualized environments
- metering of CPU, network and storage utilization

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- throttling of CPU, network and storage utilization
- multi client capable services

6.1.11 Administration

Ability to administer the ABIS during its operation.

The solution should support:

- ability to administer the solution with minimal user intervention with well defined user interfaces and access policies
- easy to use operator interface
- command line for all administrative operations
- role based administration
- automation of administrative tasks

6.1.12 Logging and Reporting

Ability to log and report at a sub-system level state, health of the solution. It shall also log different events encountered by the subsystem.

The solution shall have:

- The ability to log and create reports to know the current state of the solution and improve the quality of different services offered by the solution
- a mechanism to configure the logging level for different modules
- a mechanism to rotate the logs based on policies
- a mechanism to search through the logs with different filters
- a mechanism to integrate with alert management tools
- a mechanism to generate reports on various performance indicators
- a mechanism to integrate with external reporting tools

6.1.13 Storage Access

Ability to use heterogeneous storage environments.

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 Director, Information & Technology
 Public Health Department, Government of India
 Chandigarh



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The solution should:

- work in heterogeneous storage environments with data partitioned across servers
- function with storage getting provisioned using heterogeneous storage technologies like NAS/SAN/DAS
- access only the data to which it was given access
- support data partitioned across different servers

6.1.14 Backup/Restore

Ability to provide backup and restore of the persistent data

Solution should have:

- capability to backup and restore the data generated in the solution
- ability to backup of the data generated in the solution while continuing to process service requests.
- allowance for incremental/differential/full backup methods
- ability to take backup of application consistent data
- proper functioning after a restore operation

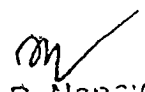
6.2 ABIS

6.2.1 Functional requirements

ABIS will provide the following functions

6.2.1.1 Enrolment Related

1. Insert: This function is used to insert biometric data (templates) into the reference database without performing biometric matching. Obtain the biometric and demographic data for the supplied ID, process the biometric samples as required by the biometric solution and store [templates] in a reference database. The function will internally invoke segmentation, feature extraction and template generation.
2. Identify: This function is used to perform de-duplication and identification (in case of lost UID of an enrolled person) across entire or sub-set of the database. It compares the


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query data for the supplied index against the entire reference database, sub-set of the database, a set of supplied indices or a single supplied index. Incoming query data samples always consist of images, possibly cropped and losslessly compressed. The function returns a candidate list of transaction numbers of potential duplicates above a threshold and associated comparison scores scaled on the interval [0,100] with 0 being the measure of least similarity.

3. Delete: This function is used to remove an ID from the reference database. The removal need could arise for variety of reasons.

Updating biometric data in the reference database will be accomplished by inserting a new record. On rare occasion, the ABIS will be subsequently directed by the UID application to delete an existing record in connection with the update operation.

6.2.1.2 Management related


Management related functions will be at two levels of security and allow the ABIS component to be managed using programming interface. On the higher security level, the key required functions include

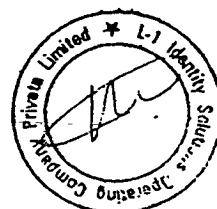
1. Shutdown. The ABIS component is required to shut itself down.
2. Clear. The ABIS component is required to delete all the data from its reference database and clear all queues.
3. Configure. At the time of initialization, ABIS component is provided with vendor specific information to configure itself. The information will include operating characteristic.

Pinging the system is at the lower security level. Additional functions required for system management, configuration, logging and reporting should be provided under the appropriate requirements. They are not part of the API at this time but accessible through the system management console.

6.2.1.3 Verification related

1. Verify. Verify is a special case of Identify mentioned above where only 1:1 comparisons are performed. The ABIS is sent a query consisting of a fingerprint or iris image or a 19794-2 compliant fingerprint template, and the index number of the enrolment record to which the query is to be compared. A scaled comparison score and a "match/non-match" decision is always returned. Fingerprint verification utilizing 19794-2-compliant templates will be done without use of proprietary extended data.


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6.2.2 Data storage requirement

Persistent data including the reference database may be stored in industry standard RDBMS or in file system. In both cases, the vendor should provide export tools to allow access to the data in situations including but not limited change of vendor, database synchronization, backup, upgrade or maintenance. The exported data should be in industry standard format readable using open source tools.

ABIS should have necessary backup and restore functions for routine system administration.

A copy of the reference database will be stored in a industry standard database or file system existing at a separate location. Therefore BSP shall provide all necessary assistance for the same.

6.2.3 Logging and monitoring

Capability to log transactions at the component interface level, should be implemented such that it allows dynamic starting and stopping of this transaction logging service. The level of logging should be controllable using a configuration parameter.

The audit system should be centrally managed and should be secured against tampering. The system should be able to capture before and after values from transaction logs, privileged user audits, raise alerts on suspicious activity. It should provide security facilities for role segregation within audit organization in terms of administrator, auditor etc. These audit logs should be kept per the retention policy of the UID application. Until UID's retention policy is published, BSP will retain all logs as specified in indicative list below.

Audit and logging system should be scalable and should have the space to grow. The system should be flexible to accommodate new audit requirements in the future.

6.2.3.1 ABIS Log

- Template generation Time
- Total time taken for multi modal matching process (in seconds),
- Matching algorithm throughput,
- Matching scores of each matcher including Fusion and the decision.
- Percentage of automated identification vs. manual intervention rate

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Director General of Identification
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Government of India



6.2.5 Security Requirements

All persistent personal information data will be encrypted.

Encryption password or user name/password should be required for data access.

ABIS will not have access and should not try to access any network resources except the resources referenced by the URLs provided through the API.

All backup data shall be stored in encrypted format using a key(s) available to the UIDAI.

6.2.6 Operator Interface Requirements

All administration and configuration features should be available through graphical UI (in addition to command level access).

6.2.7 Platform requirements

ABIS should be compatible with Linux OS with both 32 and 64 bit support on X86 COTS H/W.

6.2.8 Standards


ABIS will comply with most recent applicable ISO standards and Biometric Standards for UID Applications

6.3 Multimodal SDK

The SDK is a set of libraries that provide following functions.

6.3.1 Fingerprint

1. Segmentation. Slap sequence check / segmentation will be used to check if the claimed sequence: right or left slap is correct and also to visualize the segmentation result and use it for the feature extraction. It segments slap image of 2 to 4 fingers into respective digits with associated confidence level of segmentation accuracy. It will allow specification of missing or extra digits.
2. Quality check. The capture quality check will be used to determine if the enrolment software needs to re-capture and provide corrective action; for example finger is misplaced on the scanner. Quality check must be able to provide actionable feedback (e.g., "move finger to the left").


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3. Compression/decompression and format conversion: For verification applications, transmission of single fingerprints compressed by WSQ compression will be required, with decompression upon receipt by the verification function. During enrolment, the SDK is required to convert the image format such as from RAW to PNG. The SDK will supply WSQ compression and de-compression algorithms with tunable compression ratio
4. Template generation. The SDK should be able to generate ISO/IEC 19794-2:2005 compliant templates that have been tested to be interoperable with other third party matchers in an independent test.
5. Identification (1:N_{few}). The SDK will be able to compare features extracted from a FP image against a set of reference templates and return a scaled comparison score between [0,100], with 0 indicating least similarity.
6. Verification (1:1). The SDK will be able to compare features extracted from a FP image against a specified reference templates and return a scaled comparison score between [0,100], with 0 indicating least similarity.

6.3.2 Iris

1. Quality check. The capture quality check will be used to determine if the enrolment software needs to re-capture and provide corrective action, for example image is out of focus or has motion blur. Quality check should be able to provide actionable feedback.
2. Segmentation: The SDK will be able to extract KIND_VGA, KIND_CROPPED, and KIND_CROPPED_AND_MASKED from ocular image.
3. Compression/decompression and format conversion: The SDK will be able to convert image from one format to another (for example, BMP to KIND_VGA)
4. Feature/Template generation: The SDK will be able to extract and store a proprietary template from the segmented iris image.
5. Identification (1:N_{few}). The SDK will be able to compare features extracted from a query iris image against a set of reference templates and return a scaled comparison score between [0,100], with 0 indicating least similarity.
6. Verification (1:1): The SDK will be able to compare features extracted from a query iris image against a specified reference template and return a scaled comparison score between [0,100], with 0 indicating least similarity.

6.3.3 Face Photo

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1. Automatic Capture. Automatic capture will analyze video frames from the camera, provide the actionable feedback, and select the best frame.
2. Quality check. The capture quality check will be used to determine if the enrolment software needs to re-capture and provide corrective action.
- 3. Image enhancement. Enhancement such as face cropping will automatically find the face in the photograph and crop/resize the image to an ICAO compliant format. The SDK should not carry out any gray-level manipulations.
4. Feature/Template generation: The SDK will be able to extract and store a proprietary template from the segmented face image.
5. Compression/decompression and format conversion. The SDK will be able to convert image from one format to another (for example, BMP to JPEG 2000) and compress or decompress images.
6. Identification (1:N_{few}). The SDK will be able to compare features extracted from a query iris image against a set of reference templates and return a scaled comparison score between [0,100], with 0 indicating least similarity.
7. Verification (1:1). The SDK will be able to compare features extracted from a query face image against a specified reference template and return a scaled comparison score between [0,100], with 0 indicating least similarity.

6.3.4 Standards requirements

All uncompressed images should be as per UID standards (e.g., PNG).

All compressed images should be as per UID standards (e.g. WSQ or JPEG 2000)

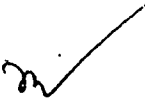
6.3.5 Reliability Requirements

The SDK should perform consistent to the specifications, for all possible data in the specified formats. The results should be reproducible on a variety of platforms. The libraries should work without any segmentation violations, memory faults or memory leaks.

6.3.6 Security Requirements

SDKs should be purely computational libraries and should have minimum system dependencies and should not attempt to access any resources such as hardware, files or network.

6.3.7 User Interface Requirements


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Responsible for the development and maintenance of the
"Data Management and Security" module.



SDKs should not have any user interface.

6.3.8 Platform requirements

SDK should support Windows (XP & above) and Linux Os with both 32 and 64 bit support.

7 LOAD AND PERFORMANCE REQUIREMENTS

Data base size	Peak De-duplication requests	Peak verification requests
20 Crore (200 Million) records	10 Lakh (1 Million) requests/day (in 24 hours)	Fingerprint template: 10 Lakh (1 Million) requests/hour Iris image: 10,000 requests/hour Face photo: 2,000 requests/hour

Metric	De-duplication	Verification
Accuracy	False Positive Identification Rate < 0.1% for database size of 20 Crore. False Negative Identification Rate < 1% for database size of 20 crore.	False Acceptance Rate < 0.01% at False Rejection Rate < 2%.
Response time	No daily backlog	< 0.1 second average for biometric verification using ISO FP template while using SDK ¹ . < 0.5 second average for biometric verification using ISO FP template while using ABIS.

SDK matching accuracy rates must meet the FAR and FRR rates required for verification on operational data as given above. The SDK licensing is required for

¹ Using standard COTS hardware specified in clause 8. Maximum of two fingerprint ISO templates to be matched against ten fingerprint ISO templates.

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1. Enrolment stations required to perform 200 crore enrolment over the contract period.
2. Authentication servers required to support peak authentication requests at the specified response time level
3. Adjudication stations required to support FPIR for the enrolment rate mentioned above.
4. System monitoring and analysis servers for ABIS configuration to support 200 crore DB size over the contract period.

8 SERVER, STORAGE AND OTHER INFRASTRUCTURE

8.1 Supply of hardware by Biometric Solution Provider for the first 1 Crore allotted enrolments

Biometric Solution Provider, as a part of this project, shall provide all the hardware of required capacity for de-duplications of the first 1 Crore enrolments. The hardware shall include all components, including physical racks, required for performing the required services to meet the performance level expectations as stated in Section III-Attachment-Draft Service Level Agreement. The components of hardware that Biometric Solution Provider should include, but not limited to:

- a) Blade Server
- b) Blade Chassis
- c) SAN (Storage Area Network)


The components should be supplied for deployment of the overall solution at both primary site and BCP site in 1:1 configuration

The minimum expected specifications for the key components that the hardware should comply with are provided in Section VI.b. The Biometric Solution provider shall be responsible for supply, installation and commissioning of all hardware supplied along with installation and commissioning of the overall solution.

Tier 3 DC environment facility would be made available for the solution. UIDAI shall provide only the datacenter space, power and cooling infrastructure and a standard 10 gbps network switch to connect with the rest of CIDR network in the Datacenter.

The hardware components to be provided by Biometric Solution Provider should adhere to following:

1. Should be compatible with all required interfacing devices and appliances in the datacenter


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2. Specifications should allow UIDAI to scale up the infrastructure to 20 Crore enrolments and beyond
3. Should be able to interconnect and interoperate with all required interfacing devices and appliances in the datacenter
4. Should comply with the Datacenter standards, policies and procedures laid out by UIDAI
5. Should adhere to BCP strategy laid by UIDAI and should be compatible with industry leading replication technologies and backup application softwares available in the market presently
6. Should provide APIs for integration with leading IT infrastructure management solutions and comply with policies of enterprise management
7. Compatible with the Indian standard power ratings.
8. The servers configuration of the servers that Biometric Solution Provider shall supply should have been field tested for at least 3 months at the release of this RFP
9. The OEMs of Servers proposed to be supplied should have been in the business of manufacturing the servers for at least 4 years

In case if any of the component does not comply with the UIDAI standards or is not in line with future direction of UIDAI, UIDAI will have the right to ask for replacement from the biometric solution provider and Biometric Solution Provider shall provide the replacement at no additional cost.

Table below provides some of the Datacenter environment constraints that the Biometric Solution Provider should note while finalizing the Hardware Infrastructure to be provided.

Parameter	Value
Preferable Rack Size	42 U / 19 Inch high, 600 mm wide, 1000 mm deep
Allocated power per Rack	7 KVA

The bidder should, as part of the Technical Proposal, provide details on the hardware supplied that shall include the following:


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1. Logical and deployment diagrams with details on number of blades per chassis, chassis per rack, power and cooling requirements, connectivity for n/w and storage.
2. Specifications of blade servers, blade chassis and Storage to be provided by provided responses in Section VI.b
3. Bill of Quantity of all components and peripheral devices in terms of quantity and specifications without the mention of any prices as per Annex 4.4.3 in Section IV
4. Storage requirement for backup
5. Details on Warranty period and Annual Maintenance from the hardware OEM for each of the component

The payment for hardware supplied by the Biometric Solution Provider shall be a fixed amount as per the payment terms stated in Section III – General Conditions of Contract

Provision of System and Other Softwares:

As part of overall Solution to be installed, configured and maintained, Biometric Solution Provider shall also factor the required systems softwares that shall include, but not limited to, the softwares indicated in Section VI.c.

All softwares proposed shall be considered as a part of the black box ABIS solution and the associated cost shall be factored as part of De-duplication services cost as mentioned in Clause 25 of Section II.

8.2 Supply of hardware by UIDAI after first 1 Crore allotted enrolments

As stated above, Biometric Solution Provider shall supply the required hardware for the capacity of first 1 Crore enrolments. For enrolments after the first 1 Crore enrolments, UIDAI or UIDAI nominated agency shall provide the Blade Servers or equivalent computing power and Storage across the 3 bands of enrolment volumes and in quantity as per the schedule provided below

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Enrolment Transactions	Quantity of Blade Server or equivalent computing power (Number of Units)	Storage Capacity (in TB)
From first 1 Crore allotted enrolments transactions to 5 Crore allotted enrollment transactions	Up to 20 Blade Servers or equivalent computing power	Up to 10 TB
From first 5 Crore allotted enrolments transactions to 10 Crore allotted enrollment transactions	Up to 80 Blade Servers or equivalent computing power	Up to 50 TB
From first 10 Crore allotted enrolments transactions to 20 Crore allotted enrollment transactions	Up to 200 Blade Servers or equivalent computing power	Up to 100 TB

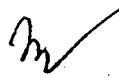
The Biometric Solution Provider shall raise the request of additional servers and/or storage at least 3 months in advance for UIDAI or the nominated agency to provision for the same.

In case if the Biometric Solution Provider's requirement for server and storage during any of the 3 bands exceeds the maximum quantity provisioned by UIDAI, the Biometric Solution Provider shall compensate UIDAI on the cost for the additional hardware to be procured from its hardware supplier agency along with the associated costs on power, cooling, datacenter space and maintenance charges.

On the other hand, additional incentives for using less than prescribed hardware in each band above, for meeting the required number of allotted transactions, shall be provided to the Biometric Solution Provider. The plan for incentive shall be formulated by UIDAI keeping in view of reducing the overall cost.

9 STATEMENT OF WORK

Please refer to Clause 12 Project Plan & Timelines to gain an understanding on how the implementation is envisaged to be carried out.


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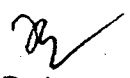
9.1 Project initiation

Within 7 Calendar days of award of contract, the BSP is required to do the following:

- a. Mobilize the team for the project. The BSP shall deploy personnel including the Key Personnel as mentioned in the Clause 11 Constitution of Team.
- b. Initiate the supply of all required hardware and storage infrastructure, including but not limited to, servers and storage as required to support 1 Crore enrolment as per the minimum requirements stated in Section VI.b. The BSP shall bring all the required hardware as required to support 1 Crore enrolment.
- c. Conduct a kick-off meeting with UIDAI with participation from key personnel proposed for the project to discuss the project plan for way forward
- d. Submit a plan for procurement, transportation, installation and commissioning of hardware in UIDAI's data centers both Primary and BCP sites located in Delhi and Bengaluru respectively. The BSP shall adhere to environment specifications of these sites and adhere to the BCP plan. There shall be Zero data loss while switching from Primary to BCP site maintained as active-passive with 1:1 capacity.
- e. Co-ordinate with Data Center service provider and prepare a blue print for deployment of hardware, ensure availability of power and other environmental facilities in the datacenter
- f. Set up the required Test and Production environment s for the rollout of PoC. The hardware used for Solution Demonstration exercise as part of the RFP evaluation process could be used for the rollout of PoC, if found adequate to meet the requirements based on expected enrolment transactions.
- g. Begin to supply SDK perpetual licenses of the proposed multimodal SDK to cater to requirements as stated in Clause 4. Biometric Solution Components
- h. Support ASDMSA in developing the client enrolment software through provisioning licensing, training and services. SDK licenses must not use hardware license key or keyed to ID (such as CPU, serial number, Ethernet ID).

✓ 9.2 Implementation of Solution as Proof of Concept (PoC)

As stated in Clause 12 Project Plan & Timelines, the BSP shall deploy the solution in the form of Proof of Concept (PoC) that shall cater to the early enrolments of the residents.


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The solution in PoC should cater to early volumes of enrolment. The solution in PoC shall at minimum provide:

- a. Integration of ABIS component with UID application at server side
- b. Integration of Multimodal SDK with Enrolment Client application
- c. Configuration of business rule and application level policies related to de-duplication and verification as stated by UIDAI
- d. Perform de-duplication checks (1:N) for enrolment subjects on a reference database up to 10 lakhs
- e. Perform biometric verifications (1:1) using the ABIS component for at least up to 10,000 verifications per day. The full scale solution as detailed in Clause 4 Biometric Solution Components shall be using Multimodal SDK for the verification services

The BSP shall rollout the solution after a review and testing of the same UIDAI. The BSP shall be responsible for application availability while in production and shall deploy the solution at both Primary and BCP sites and adhere to BCP plan including data backup and recovery

Continuous performance monitoring and improvement of the solution in terms of accuracy, throughput and optimum resource usage shall be undertaken by the BSP. The learnings shall be used towards configuration of the Solution

The SLAs as stated in Draft Service Level Agreement of the RFP shall not be applicable for the solution when in PoC.


The solution shall be in PoC until the go-live of the full scale solution. The BSP shall be responsible for transition from PoC to full scale solution without any data loss and minimal disruption of operations.

9.3 Installation, Configuration and Commissioning of the full scale Solution

9.3.1 Installation and Commissioning for all Servers

The BSP along with UIDAI, and datacenter service provider should undertake pre-installation planning at Primary and BCP sites including but not limited to Rack planning, structured cabling, power points, check on utility services, environmental conditions, etc.

Delivery, Installation and commissioning of the hardware servers and related equipment in the Datacenter Space provisioned by UIDAI at their Primary and BCP sites.


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The plan and layout design for the placement of equipment in the provisioned datacenter is required to be carried out by the BSP. The BSP should provide an elevation plan for each of the Primary and BCP datacenter for housing of the servers and other equipment.

The plan and layout design shall be developed in a manner so as to optimally and efficiently use the resources and facilities available or being provisioned at the respective datacenters viz. space, racks, power, air-conditioning, cabling, etc.

The BSP should co-ordinate with the datacenter provider of UIDAI in order to prepare the plan and develop the layout design.

The plan and design documents thus developed shall be submitted to UIDAI or its nominated agency for approval and the acceptance should be obtained prior to commencement of installation.

Carry out installation of equipment in accordance with plans and layout design as approved by the UIDAI

Installation and configuration of the software including, but not limited to, Operating System (OS), System software, etc. on the servers would be responsibility of the BSP. The BSP should also tune parameters for optimal performance of the OS should be carried out.

Undertake necessary changes to harden the OS to prevent against malicious and unwarranted attacks.


The BSP will install all necessary software infrastructure and middleware including Database, Application Server software, and tune appropriate parameters in this software to ensure optimal performance should also be undertaken.

9.3.2 Storage Installation and Configuration

The BSP should undertake study of the application environment in order to plan for an integrated storage infrastructure based on SAN. The zoning, LUN and volume creation should be decided based on the characteristics of the application.

Develop an implementation plan, installation and configuration of the SAN array to implement the overall solution.

The deployment of the disk storage shall consists of tasks, including, but not limited to, installation and configuration of SAN design, creation and configuration volumes, LUN, RAID storage sets, assisting in migration of data, if any and undertake tuning exercise to optimize performance of the solution.


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9.3.3 Setting up of Testing, and Production Environments

BSPs shall set up Test and Production environments. The environments are to be established to serve various purposes along the biometrics solution lifecycle. The following section describes each of these environments.

The BSP shall undertake setting up of infrastructure related to propose solution by verifying the infrastructure being deployed, installed and commissioned and verify the entire setup once before activating the environment. The BSP shall also periodically verify the adequacy of the environments during operations after the setup and notify UIDAI on the any issues requiring action.

9.3.3.1 Production Environment


Production environment shall compose of racks containing servers, storage, communications equipment, security devices as required for by the proposed Biometric Solutions. The production environment shall be common for the entire CIDR infrastructure used in production that includes infrastructure from other BSPs.

9.3.4 Configuration and Integration of the Solution

The BSP shall use all the learnings from the Proof of Concept (PoC) towards configuring the solution to meet the performance and load requirements during the contract period.

The BSP shall undertake the following as part of Solution configuration

- a. Configure the solution to comply with the UIDAI policies and other business rule and application level policies as stated and finalized by UIDAI
- b. To configure / tune the ABIS solution and underlying algorithms in order to meet the performance requirements as stated in Attachment 1 – Service Level Requirements considering the expected increase in enrolments and growth of the reference database
- c. Configuration of ABIS solution's own internal persistence/database component with adequate back-up and recovery in compliance with UIDAI BCP plan and data backup and recovery strategy.
- d. Integration of ABIS component with UID application at server side


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- e. Assist UIDAI and ASDMA with integration of Multimodal SDK libraries with UID application modules related to verification. The Multimodal SDK (server license component) shall be used for Biometric verification (1:1).
- f. Assist UIDAI and ASDMA undertake Integration of Multimodal SDK with Enrolment Client application, adjudication and monitoring module.
- g. Provide training to UIDAI and ASDMA undertake integration of the ABIS and Multimodal SDK with UID application
- h. Submit documentation of key configuration settings, business rules and policies adopted along with key design and solution features along with user manuals to UIDAI for their review and acceptance.

9.3.5 Testing

Under the Testing stage, BSP shall carryout Integration Planning & Testing (within the solution across modules and third party algorithms and also the external integration with APIs provided by UIDAI) as well as System Test Planning & Testing phases. The following sections explain the scope of each phase BSP is expected to perform.

Integration Planning & Testing

BSP shall identify the critical modules to be integrated, identify order of integration and identify interfaces to be tested.


Along with planning for system integration, BSP shall develop integration test cases and include these in integration test plan and submit the same for review to UIDAI

BSP shall undertake the actual integration activity as per the integration test plan. Subsequently, integration testing shall be carried out as per the plan, log all defects found and shall ensure these defects are rectified and re-tested.

Testing stage shall include testing of the integration of the proposed solution components (Server side ABIS and Client side SDK) with respective APIs provided by UIDAI.

The BSP shall be jointly responsible with ASDMA in integration and end to end testing of each integration interface at client and server side applications

BSP shall maintain the integration test plan along with test results & defect statistics and provide the same to UIDAI, if desired so.


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BSP submit report on integration for third party audit

System Test Planning & Testing

BSP shall plan out a series of different tests, each test having a different purpose, to verify that all system elements have been properly integrated and that the system performs all its functions and satisfies all its non-functional requirements.

The inputs for this phase consist of the requirement specification document (SRS) and the initial system test plans where as the outputs consist of system test plan and test results.

As part of system test planning, BSP shall identify features that shall be tested and features that need not be tested.

On successful completion of the Integration testing, BSP shall carry out the actual system testing as per the system test plan.

BSP shall ensure that system testing is carried out by an independent team other than the development team. BSP shall setup a separate test environment with test database to carry out system testing.

As part of the system testing, BSP shall carry out Performance testing of the application to ensure that the application meets the performance requirements.


BSP shall maintain the system test plan and test results with defect statistics and provide the same to UIDAI.

BSP shall submit a report on testing to UIDAI for review

Stakeholder testing (User Acceptance Testing)

Stakeholder testing consists of formal testing conducted by the user group according to the test plan and analysis of the test results to determine whether the system satisfies its acceptance criteria.

- i. BSP shall prepare a plan to coordinate the User testing activity.
- ii. BSP shall prepare a software release note that contains stepwise instructions for UIDAI on how to install the software. The instructions shall include information on creating the directory structures, installing source and executables, loading data needed for installation and so on.
- iii. The primary responsibility for acceptance testing lies with the user group and UIDAI shall coordinate with BSP to ensure necessary support is available to the user group.


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- iv. End user/testing group shall document the test cases / scenarios to ensure that the defined acceptance criteria are validated during the testing.
- v. The test cases prepared by third party shall be approved and used by UIDAI for the purpose of testing
- vi. BSP shall provide support to document the User Test Results along with Defects Statistics. BSP shall ensure that defects found are corrected and is retested by the end user group.
- vii. The testing shall be taken in iterations till the specified requirements are met
- viii. Test results shall be audited by a third party
- ix. On successful completion of User Testing, BSP shall obtain a formal sign-off from UIDAI for solution go-live.

9.4 Go-live of Solution


BSP, in coordination with UIDAI, shall prepare setting up the production environment, installation of the application in the production environment.

BSP shall rollout the application. BSP shall coordinate with UIDAI to resolve any problems encountered after rollout. All post implementation issues shall be documented and the necessary fixes / resolutions shall be implemented by BSP.

BSP shall ensure necessary support is provided to resolve defects. BSP shall document the defects / bugs encountered during this phase as well as document the resolution of the same. BSP shall also prepare and maintain a database of Consolidated List of Common Errors & their Resolution.

9.5 Activation of SLAs

The Biometric Solution Providers shall undertake performance improvement measure for the solution until the solution meets the required Solution related performance service levels as stated in Attachment 1- Draft Service Level Agreement. After a period of 8 (eight) weeks after go-live or on completion of 1 Crore enrolments, whichever is earlier, the Solution shall be required to comply with the Service Level Agreements. The BSP shall be required to submit an undertaking to UIDAI on formally complying with the SLAs in order for the solution to be finally accepted for future allocation of transactions. Formal compliance to SLA is perquisite for the BSP to be considered for dynamic allocation of enrolment


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volumes. Please refer to Annexure D – Work Allocation and Service Level for more details on dynamic allocation of transactions across multiple BSPs selected through this RFP.


9.6 Requirements Change Management (Pre-implementation)

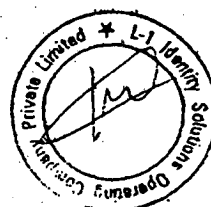
UIDAI expects upgrades to occur during the contract period. If there are changes in requirements during the contract period post go-live, BSP in consultation with UIDAI is expected to define a formal process to manage the requirements changes as defined for illustration below:

BSP shall maintain a change request log to keep track of the change requests. Each entry in the log shall contain a Change Request Number, a brief description of the change, the effect of the change, the status of the change request, and the key dates.

BSP shall assess the effect of the change by performing impact analysis.

BSP shall maintain the change request log with updated information and provide the same to UIDAI as and when desired.


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Director General, Department of Information Technology,
Ministry of Home Affairs, Government of India,
Central Secretariat, New Delhi-110001




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S.No	Range of enrolment transactions	Cycle Name
3	2 to 3 Crore transactions	Cycle 3
4	3 to 4 Crore transactions	Cycle 4
5	4 to 5 Crore transactions	Cycle 5
6	5 to 6 Crore transactions	Cycle 6
7	6 to 7 Crore transactions	Cycle 7
8	7 to 8 Crore transactions	Cycle 8
9	8 to 9 Crore transactions	Cycle 9
10	9 to 10 Crore transactions	Cycle 10
11	10 to 11 Crore transactions	Cycle 11
12	11 to 12 Crore transactions	Cycle 12
13	12 to 13 Crore transactions	Cycle 13
14	13 to 14 Crore transactions	Cycle 14
15	14 to 15 Crore transactions	Cycle 15
16	15 to 16 Crore transactions	Cycle 16
17	16 to 17 Crore transactions	Cycle 17
18	17 to 18 Crore transactions	Cycle 18
19	18 to 19 Crore transactions	Cycle 19
20	19 to 20 Crore transactions	Cycle 20

*Note:- No. of allocation cycle shall depend on the rate of actual enrollments undertaken during the Contract period

3. Rules of Allocation

- The duration of an allocation cycle shall be 3 (Three) months or till the time of completion of 1 (One) Crore new enrolment transactions, whichever is earlier. Each allocation cycle can hence have a maximum of 1 Crore enrolment transactions.
- The enrolment transactions in Cycle 1, i.e., from Zero to 1 Crore Transactions shall be assigned to all the Biometric Solution Providers, meaning, each Biometric Solution Provider shall perform successful de-duplication check on the same 1 Crore subjects.
- From Cycle 2 onwards, daily volumes shall be allocated separately to Biometric Solution Provider in proportion of the total volumes per day.
- The proportion of allocations across Biometric Solution Providers shall remain fixed for the allocation cycle under consideration. The maximum allocation of enrollment


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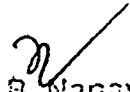
- xiv. **"False Negative Identification"** A term applying to de-duplication transactions only. An incorrect decision of a biometric system that an applicant for a UID, making no attempt to avoid recognition, has not previously been enrolled in the system, when in fact they have. This failure to match might be caused by any algorithm in use by the system (segmentation, comparison, binning, quality, etc.).
- xv. **"False Negative Identification Rate (FNIR)"** A term applying to de-duplication transactions only. The ratio of number of false negative identification decisions to the total number of enrollment transactions by enrolled individuals. This rate is expected to depend upon the database binning/partitioning used to meet throughput requirements. Enrolled database size will be specified. As no failure-to-enroll decisions will be permitted for residents with any of the 12 biometrics available, failure-to-enroll rates are presumed to be zero and will not be considered in computing the false negative identification rate. Data from residents with none of the 12 biometrics will be exempted from the calculation of this rate.

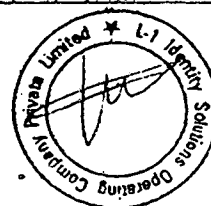
2. Dynamic Allocation

- i. UIDAI shall allocate the transaction volumes related to enrolment to the selected Biometric Solution Providers based on the performance of their respective solution, as deployed, on following parameters respectively:
 - a. Accuracy, measured in terms of FPIR and FNIR, of De-Duplication checks
 - b. Speed of De-duplication
 - c. Hardware Resources used by the biometrics solution
- ii. The total number of enrolment transactions during the contract period is expected to be 20 Crores and the same shall be divided into multiple cycles called as Allocation Cycle with duration of 3 months per cycle. Following indicates the distribution of enrolment transaction volumes across allocation cycle. An allocation cycle can have a maximum of 1 Crore enrolment transactions

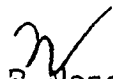
Table 1 - Allocation Cycles*

S.No	Range of enrolment transactions	Cycle Name
1	0 to 1 Crore transactions	Cycle 1
2	1 to 2 Crore transactions	Cycle 2


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- viii. **"Non performance of a Biometric Solution"** If the solution provided by a Biometric Solution Provider does not meet even minimum limit of accuracy for de-duplication in a cycle, then it is treated as non performance of the Biometric Solution. Any drop in accuracy of the de-duplication checks by the Biometric Solution below certain limits shall be treated as non performance of the Biometric Solution Provider. The accuracy shall be measured by service levels under category 'Accuracy' in Clause 7.2.1 Biometric De-Duplication - Performance Levels effective from Release 2 of Draft Service Level Agreements. A measurement of service level below the stated limits shall be treated as non performance of the Biometric Solution Provider.
- ix. **"Transfer of Volumes"** Assignment of a certain part or the whole share of the enrolment transaction volumes of a Biometric Solution Provider for the next cycle, to one or more Biometric Solution Providers before the commencement of the next cycle in addition to their respective shares of volumes.
- x. **"Probation"** A period during which the Biometric Solution Provider cannot undertake its normal operations based on allocation of enrolment transaction volumes. During Probation, only a limited percentage of its normal allotted share of enrolment transaction volumes is provided to the Biometric Solution Provider. The period of probation is equal to the duration of the next Allocation cycle in which it is kept under probation.
- xi. **"Rehabilitation"** A period during which the Biometric Solution Provider cannot undertake its normal operations. During Rehabilitation, the Biometric Solution Provider shall not receive any allocation of enrolment transaction volumes from the next cycle onward unless it successfully meets the acceptance criteria of the testing conducted by UIDAI after a certain period of time.
- xii. **"False Positive Identification"** A term applying to de-duplication transactions only. An incorrect decision of a biometric system that an applicant for a UID has previously been enrolled in the system, when in fact they have not.
- xiii. **"False Positive Identification Rate (FPIR)"** A term applying to de-duplication transactions only. The ratio of number of false positive identification decisions to the total number of enrollment transactions by un-enrolled individuals. This rate is expected to depend upon the size of the enrolled database and the database binning/partitioning used. Enrolled database size will be specified.


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Work Allocation & Service Level


1. Allocation of Transaction Volumes to Biometric Solution Providers

1.1 Overview

- i. UIDAI shall select three Biometric Solution Providers for the undertaking the scope of work as stated in Annexure E – Scope of Work. Based on the estimates of expected demand for enrolments during the contract period, UIDAI shall adopt a method of dynamic allocation of enrolment transactions to the selected Biometric Solution Providers.

1.1.1 Definitions of Terms

- i. 1 Crore = 10 million
- ii. 1 Lakh = One Hundred Thousand
- iii. "Biometric Solution Provider" The party who is awarded the contract, on being selected using the process stated in the RFP, to provide services as mentioned in the Annexure E – Scope of Work.
- iv. "Enrolment transactions" The transaction to perform de-duplication in order to check if there exists any duplicate(s) for the subject being enrolled
- v. "Allocation Cycle" The period for which the allocation of transactions volumes to Biometric Solution Providers remains fixed. The duration of the cycle shall be 3 (Three) months or till the completion of 1 (One) Crore new enrolment transactions, whichever is earlier. Each allocation cycle can hence have a maximum of 1 Crore enrolment transactions.
- vi. "Allotted Enrolment transactions" The transaction allotted to a Biometric Solution Provider to perform de-duplication in order to establish if there exists any duplicate(s) for the subject being enrolled
- vii. "Normal Operations" The regular course of operations whereby the Biometric Solution Provider receives its allotted share of enrolment transaction volumes based on computation of allocation among all the Biometric Solution Providers

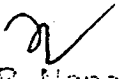

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Annexure D
Work Allocation &
Service Level

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Deputy Commissioner, Authority of India,
Punjab & Chandigarh, Chandigarh (India),
Chandigarh (India), New Delhi-110001



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B.E. Manawati, ooc
Director General of the Ministry of Health
Ministry of Health, P.O. Box 110001
Constitutional Court, P.O. Box 110001



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	limit	
	Resolution of ≥ 96 to < 97 % of the total calls within the specified limit	5
	Resolution of ≥ 95 to < 96 % of the total calls within the specified limit	6
	Resolution of < 95 % of the total calls within the specified limit	7

8. Signature

IN WITNESS WHEREOF, the parties hereto have caused this Service Level Agreement to be executed by their respective authorized representatives as of the date first written above.

Signed, Sealed and Delivered for &
on behalf of M/s L-1 Identity
Solutions Operating Company
Private Limited

Signed

Name: Machiel van der Harst

Designation: Technical Officer

Date: August 24th, 2010

Place: New Delhi

Signed, Sealed and Delivered for and on
behalf of the President of India acting
through the Director General, Unique
Identification Authority of India.

Signed

Name: B. B. Nanawati, ODC
Unique Identification Authority of India,
Planning Commission, Jeevan Bharati,
Connaught Circus, New Delhi-110001

Designation: Deputy Director General

Date: August 24th, 2010

Place: New Delhi

In the presence of

Signed

Name: Kalidindi R N R

Designation: Director, Business
Development, L1 IDDate: August 24th, 2010

Place: New Delhi

In the presence of:

Signed

Name: AJAY NANDAN
Assistant Director General
Unique Identification Authority of India,
Planning Commission, Jeevan Bharati,
Connaught Circus, New Delhi-110001

Date: August 24th, 2010

Place: New Delhi

B.B. Nanawati, ODC
Unique Identification Authority of India,
Planning Commission, Jeevan Bharati,
Connaught Circus, New Delhi-110001



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Measurement	Definition	Target	Severity Level
Reporting			
Data Quality Monitoring & Reporting	Refer Annexure E – Scope of Work	Less than 100% adherence to time lines specified in Annexure E, Scope of Work	6
MIS reporting	Refer Annexure E – Scope of Work	Less than 100% adherence to time lines specified in Annexure E, Scope of Work	6
Incident Reporting	Refer Annexure E – Scope of Work	Less than 100% incidents to be provided to Purchaser within 1 hour with the cause, action and remedy	5

7.4. Trouble Ticket/Issue Resolution

- "Resolution Time" means time taken (after the trouble call has been logged on the helpdesk), in resolving (diagnosing, troubleshooting and fixing) or escalating (to the second level to respective Vendors, getting the confirmatory details about the same from the Vendor and conveying the same to the end user), the Services related troubles during the first level escalation.
- Provisioning of standby, if required, should be done along with associated data being restored, services reinitiated and SLA conditions being met. Final Resolution shall be deemed to be complete only after the original equipment is replaced / reinitiated along with data being restored to the correct state and services are resumed.

Resolution Time	Target	Severity Level
30 minutes	Resolution of 98% of the total calls within the specified limit	
	Resolution of ≥ 97 to < 98 % of the total calls within the specified	4

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 District Magistrate & District Collector
 District of Jalandhar, Punjab
 Government of India



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Measurement	Definition	Target	Severity Level
Resource availability for Help Desk specified in Annexure E , Scope of work during various phases of the project	No. of shift days for which resource present at the designated location / Total no. of shift days	99% averaged over all resources designated for Biometric Supplier services and calculated on a monthly basis	
		>=97 % to < 99% averaged over all resources designated for Biometric Supplier services and calculated on a monthly basis	7
		>=95 % to < 97% averaged over all resources designated for Biometric Supplier services and calculated on a monthly basis	8
		< 95 % averaged over all resources designated for Biometric Supplier services and calculated on a monthly basis	9



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7.3. Operations

Measurement	Definition	Target	Severity Level
Manpower Availability			
Resource availability for Support and Maintenance of Application specified in Annexure E, Scope of work during various phases of the project	No. of shift days for which resource present at the designated location / Total no. of shift days	99% averaged over all resources designated for Biometric Supplier services and calculated on a monthly basis	
		>=97 % to < 99% averaged over all resources designated for Biometric Supplier services and calculated on a monthly basis	7
		>=95 % to < 97% averaged over all resources designated for Biometric Supplier services and calculated on a monthly basis	8
		< 95 % averaged over all resources designated for Biometric Supplier services and calculated on a monthly basis	9


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 Planning & Operations Division, New Delhi-110001
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D.R. Nanawati, DDO
 (Joint Director, Information Security)
 Planning & Information Security Division
 Central Board of Secondary Education
 New Delhi-110002

Measurement	Definition	Target (for reference database size between 1 and 2 Crore)	Consequence	Remedy for consequence
1. False Match Rate (FMR)	FMR = (Number of verification transactions in the day resulting in a false match)/ (total number of transactions).	$\leq 0.01\%$ for all levels of verification measured per allocation cycle	None	Not Applicable
		$> 0.01\%$ and $\leq 0.1\%$ for all levels of verification measured per allocation cycle	Liquidated damages of severity level: 6	Not Applicable
		$> 0.1\%$ and $\leq 1\%$ for all levels of verification measured per allocation cycle	Liquidated damages of severity level: 8	Not Applicable
		$> 1\%$ for all levels of verification measured per allocation cycle	Liquidated damages of severity level: 9	Not Applicable
2. False Non Match (FNMR)	FNMR = (Number of verification transactions resulting in a false non match in the day)/ (total number).	$\leq 2\%$ for all levels of verification measured per allocation cycle	None	Not Applicable
		$> 2\%$ and $\leq 3\%$ for all levels of verification measured per allocation cycle	Liquidated damages of severity level: 6	Not Applicable
		$> 3\%$ and $\leq 4\%$ for all levels of verification measured per allocation cycle	Liquidated damages of severity level: 8	Not Applicable
		$> 4\%$ for all levels of verification measured per allocation cycle	Liquidated damages of severity level: 9	Not Applicable



2. Performance Level for allocation cycles with total enrolment transaction volumes above 2 Crore

- a. The Performance Criteria would be the same as those for cycle with total enrolment transaction volumes between 1 Crore and 2 Crore.
- b. However, the Purchase reserves the right to revise the targets for the performance criteria for subsequent cycle of 1 Crore enrolments (from 2 Crore enrolment transaction volumes onwards)

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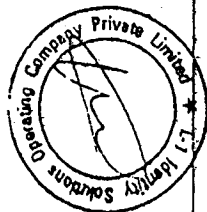
S.B. Nanawati, DDC
 Unique Identifier from Authority of India
 Planning Commission, Jodhpur Division
 Computer Centre, New Delhi, India



Measurement	Definition	Target (for reference database size between 1 and 2 Crore)	Consequence	Remedy for consequence
		seconds and less than or equal to 2 seconds measured on a monthly basis Verification Level - Medium: More than 1 seconds and less than or equal to 2 seconds measured on a monthly basis Verification Level - High: More than 1 seconds and less than or equal to 2 seconds measured on a monthly basis	level: 9	
II. Availability				
Uptime	Uptime = {1 - [(Downtime) / (Total Time – Maintenance Time)]}	Minimum 99% up time measured on a monthly basis	None	Not Applicable
		>= 99 to < 98% up time measured on a monthly basis	Liquidated damages of severity level: 5	Not Applicable
		>= 98% to < 97% up time measured on a monthly basis	Liquidated damages of severity level: 6	Not Applicable
		>= 97% to < 96% up time measured on a monthly basis	Liquidated damages of severity level: 7	Not Applicable
		>= 96% to < 95% up time measured on a monthly basis	Liquidated damages of severity level: 8	Not Applicable
		< 95% up time measured on a monthly basis	Liquidated damages of severity level: 9	Not Applicable
II. Accuracy				

Measurement	Definition	Target (for reference database size between 1 and 2 Crore)	Consequence	Remedy for consequence
I. Response Time				
Response Time per verification check	Response Time = (Number of Verification checks in 24 hours) / {[86400 seconds – idle time with no verification transaction] } using biometric based verification	<p>Verification Level - Low: Less than or equal to 0.5 seconds measured on a monthly basis</p> <p>Verification Level - Medium: Less than or equal to 0.5 seconds measured on a monthly basis</p> <p>Verification Level - High: Less than or equal to 0.5 seconds measured on a monthly basis</p>	None	Not Applicable
		<p>Verification Level - Low: More than 0.5 seconds and less than or equal to 1 seconds measured on a monthly basis</p> <p>Verification Level - Medium: More than 0.5 seconds and less than or equal to 1 seconds measured on a monthly basis</p> <p>Verification Level - High: More than 0.5 seconds and less than or equal to 1 seconds measured on a monthly basis</p>	Liquidated damages of severity level: 6	Not Applicable
		Verification Level - Low: More than 1	Liquidated damages of severity	Not Applicable

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 District Collector, District Authority of Health,
 Planning Commission, Jammu & Kashmir
 Council, Jammu, New Delhi



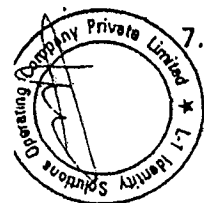
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Measurement	Definition	Target (for reference database size between 1 and 2 Crore)	Consequence / Severity in case of Liquidated damages	Remedy for consequence
		<95% up time measured on a monthly basis	Liquidated damages of severity level: 9	Not Applicable
III. Resources Deployed				
1. Total amount of hardware	Relative number of server nodes of identical configuration used	Least among all the Biometric Suppliers	Will impact allocation of transaction volumes in the next allocation cycle	Not Applicable
		> Hardware cost provided by UIDAI	Biometric Supplier to compensate UIDAI for every additional hardware purchased	Not Applicable

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2. Performance Level for allocation cycles with total enrolment transaction volumes above 2 Crore

- a. The Performance Criteria would be the same as those for cycle with total enrolment transaction volumes between 1 Crore and 2 Crore.
- b. However, the Purchase reserves the right to revise the targets for the performance criteria for subsequent cycle of 1 Crore enrolments (from 2 Crore enrolment transaction volumes onwards)



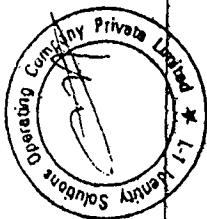
7.2.2. Biometric Verification - Performance Levels effective from Acceptance of Solution

- i. Note: There are no Biometric Verification (1:1) Performance Levels defined under SLA prior to acceptance of the Solution.

1. Performance Level for allocation cycle with total enrolment transaction volumes between 1 Crore and 2 Crore

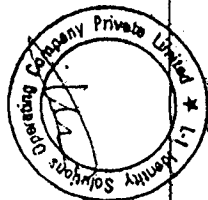
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Measurement	Definition	Target (for reference database size between 1 and 2 Crore)	Consequence / Severity in case of Liquidated damages	Remedy for consequence
1. Relative Response Time per De- duplication check	Response Time = (Number of De- duplication checks in 24 hours) / {[86400 seconds – idle time with no de- duplication transaction] * Total number of CPU cores used}	Least among all the Biometric Suppliers	Will impact allocation of transaction volumes in the next allocation cycle	Not Applicable
III. Availability				
1. Uptime	Uptime = $1 - \frac{((\text{Downtime}) / (\text{Total Time} - \text{Maintenance Time}))}{1}$	Minimum 99% up time measured on a monthly basis	None	Not Applicable
		>= 99 to < 98% up time measured on a monthly basis	Liquidated damages of severity level: 5	Not Applicable
		>= 98% to < 97% up time measured on a monthly basis	Liquidated damages of severity level: 6	Not Applicable
		>= 97% to < 96% up time measured on a monthly basis	Liquidated damages of severity level: 7	Not Applicable
		>= 96% to < 95% up time measured on a monthly basis	Liquidated damages of severity level: 8	Not Applicable

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 Government of India, New Delhi
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Measurement	Definition	Target (for reference database size between 1 and 2 Crore)	Consequence / Severity in case of Liquidated damages	Remedy for consequence
			continues to remain below stated target%, the Biometric Solution shall be kept under Rehabilitation	
2. False Negative Identification Rate (FNIR)	FNIR = (Number of false negative identification decisions in the day)/ (total number of enrollment transactions by unenrolled individuals in the day).	<=1% measured per allocation cycle	None	Not Applicable
		> 1% measured per allocation cycle	<ul style="list-style-type: none">• Biometric Solution kept under Probation• Only 50% of its allotted shared of enrolment transactions allotted in the next allocation cycle• If the FNIR of the Biometric Solution continues to remain below state target%, the Biometric Solution shall be kept under Rehabilitation	Testing after Probation Period of 6 (six) months <i>Note: During Rehabilitation, Biometric Supplier may choose to undertake Testing before the expiry of Probation Period. However, the cost of such early testing shall be fully borne by the Biometric Supplier</i>
II. Speed				

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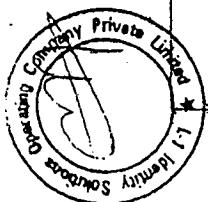
7.2.1. Biometric De-Duplication - Performance Levels effective from Acceptance of Solution

- i. Note: There are no Biometric De-Duplication Performance Levels defined under SLA prior to acceptance of the Solution

1. Performance Level for allocation cycle with total enrolment transaction volumes between 1 Crore and 2 Crore

Measurement	Definition	Target (for reference database size between 1 and 2 Crore)	Consequence / Severity in case of Liquidated damages	Remedy for consequence
I. Accuracy				
1. False Positive Identification Rate (FPIR)	FPIR = (Number of false positive identification decisions in the day)/ (total number of enrollment transactions by unenrolled individuals in the day).	<= 0.1% measured per allocation cycle	None	Not Applicable
		> 0.1% measured per allocation cycle	<ul style="list-style-type: none"> • Biometric Solution kept under Probation • Only 50% of its allotted shared of enrolment transactions allotted in the next allocation cycle • If the FPIR of the Biometric Solution 	<p>Testing after Probation Period of 6 (six) months</p> <p><i>Note: During Rehabilitation, Biometric Supplier may choose to undertake Testing before the expiry of Probation Period. However, the cost of such early testing shall be fully borne by the Biometric Supplier</i></p>

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 Director, District Cyber Security of India
 Cyber Security Division
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- i. Biometric Supplier under probation, can be considered for fresh allocation of transaction volumes based on successful testing on accuracy on prior allotted transactions as conducted by the purchaser at the end of probation period
- ii. During probation, Biometric Supplier may choose to undertake Testing before the expiry of Probation Period. However, cost of such early testing shall be borne by the Biometric Supplier

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